

## RADIATION OF THE GENUS *DYSDERA* (ARANEAE, DYSDERIDAE) IN THE CANARY ISLANDS: THE ISLAND OF TENERIFE

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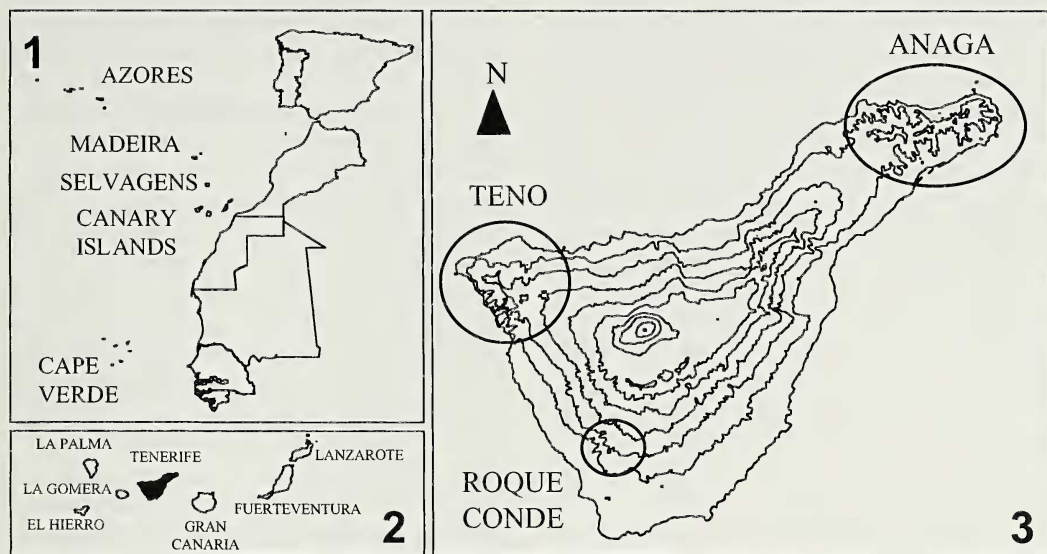
**ABSTRACT.** An overwhelming number of endemic species belonging to the spider genus *Dysdera* have been reported from the oceanic archipelago of the Canary Islands. A complete taxonomic revision is currently being performed in order to assess the extent of this species' radiation, as well as to supply enough data to place it in a phylogenetic framework. The present article is devoted to the *Dysdera* species inhabiting the island of Tenerife. A total of 22 species is recognized in Tenerife, including the cosmopolitan *Dysdera crocota* C.L. Koch 1839. Two new species are described: *Dysdera guayota* new species and *Dysdera hernandezii* new species. Ten new synonymies are reported: *D. moquinalensis* Wunderlich 1991 and *D. vilaflorensis* Wunderlich 1991 = *D. brevispina* Wunderlich 1991; *D. medinae* Wunderlich 1991 = *D. cribellata* Simon 1883; *D. inaequuscapillata* Wunderlich 1991 = *D. crocota*; *D. pergrada* Wunderlich 1991, *D. pseudopergrada* Wunderlich 1991, *D. tabaibaensis* Wunderlich 1991, *D. teideensis* Wunderlich 1991 and *D. teneriffensis* Strand 1908 = *D. macra* Simon 1883; *D. obscuripes* Wunderlich 1991 = *D. propinqua* Ribera, Ferrández & Blasco 1985. Sixteen species are redescribed: *D. ambulotenta* Ribera, Ferrández & Blasco 1985; *D. brevisetae* Wunderlich 1991, *D. brevispina* Wunderlich 1991; *D. chioensis* Wunderlich 1991; *D. cribellata* Simon 1883; *D. curvisetae* Wunderlich 1987; *D. esquiveli* Ribera & Blasco 1986; *D. gibbifera* Wunderlich 1991; *D. gollumi* Ribera & Arnedo 1994; *D. labradaensis* Wunderlich 1991; *D. macra* Simon 1883; *D. minutissima* Wunderlich 1991; *D. montanetensis* Wunderlich 1991; *D. propinqua* Ribera, Ferrández & Blasco 1985; *D. unguinmanis* Ribera, Ferrández & Blasco 1985 and *D. volcania* Ribera, Ferrández & Blasco 1985. The females of four species: *D. brevisetae*, *D. brevispina*, *D. minutissima* and *D. montanetensis* are described for the first time. Females formerly assigned to both *D. gibbifera* and *D. volcania* are considered to be incorrect identifications. A neotype is designated for *D. macra*. The presence of *D. rugichelis* Simon 1907 in Tenerife is considered to be doubtful. Ecological and distributional patterns of the species are discussed.

Species of the spider genus *Dysdera* Latreille 1804 are usually found in slightly damp but warm ground habitats. They are nocturnal wandering hunters that spend daytime in silken cocoons under stones, logs or bark (Roberts 1995; pers. obs.). *Dysdera* specimens are not unusual in caves, which can be considered as an expansion of their typical habitats; and several cases of troglomorphic species have been reported (Ribera 1983, 1993; Ribera et al. 1986). This species-rich genus includes about 200 species with a circum-Mediterranean distribution, with the single exception of the anthropophilous cosmopolitan *D. crocota* C.L. Koch 1839. The so-called Macaronesian archipelagos (Fig. 1) represent the westernmost limit of *Dysdera*'s range. One of these

volcanic archipelagos, the Canary Islands, harbors about 50 endemic species (Simon 1883, 1907; Strand 1908; Schmidt 1973; Ribera et al. 1985; Ribera & Blasco 1986; Wunderlich 1987, 1991; Ribera & Arnedo 1994; Arnedo et al. 1996; Arnedo & Ribera 1997), which represent about one quarter of the described species in the genus to date. This figure is even more remarkable when compared with the number of endemics in the remaining archipelagos: one from the Azores (undescribed species), five from Madeira (Denis 1962; Wunderlich 1994) and one from Cape Verde (Berland 1936). In addition, seven of these species were troglobites with morphological adaptations to the hypogean environment.

Nevertheless, this overwhelming number of *Dysdera* species held by the Canaries could suggest a taxonomic artifact instead of a true species radiation. A deeper look into Canarian *Dysdera* taxonomy revealed some instances

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Figures 1–3.—Maps 1–3. 1, Macaronesian archipelagos; 2, the Canary Islands; 3, Tenerife, with its oldest areas encircled.

that could, at least, call into question this amazing number of endemics. On the one hand, 22 out of the 50 recognized species were described from only one of the sexes, 19 of which were known from a single specimen. Moreover, some of the species lacked information regarding their locality, type material was lost, or both. Finally, 27 species were described in a single publication together with 106 new species from the Macaronesia (Wunderlich 1991). On the other hand, most of the published descriptions of the Canarian *Dysdera* were vague enough to correspond to more than one species, or failed to supply the necessary information for the study of such interesting spiders in a phylogenetic framework.

With the aim of confirming the existence of this radiation, completing the species descriptions as well as their geographical distributions and, finally, offering enough data to perform a phylogenetic analysis of the group, a major revisionary work on Canarian *Dysdera* is currently being developed (Ribera & Arnedo 1994; Arnedo & Ribera 1996; Arnedo et al. 1996; Arnedo & Ribera 1997). The present article is devoted to the taxonomic revision of the genus on the Island of Tenerife.

The Canary Islands lie in the Atlantic Ocean 100 km from the north-western coast of Africa (Fig. 2). The different volcanic ep-

isodes that formed the archipelago are probably the result of a propagating fracture originated in the Atlas formation during the Alpine orogeny, about 25 Mya ago (Anguita & Hernán 1975). This model would explain both the reduction of the age of the islands from east to west and the continuation of active volcanism in the older islands. The approximate ages of the subaerial parts of the islands, as recovered using the K-Ar technique, range from about 22 Mya to less than 1 Mya. The estimated geological age for each island is: Fuerteventura 20–22 Mya, Lanzarote 15–19 Mya, Gran Canaria 14–16 Mya, Tenerife 11.6–14 Mya, La Gomera 10–12 Mya, La Palma 1.6–2 Mya and El Hierro 0.8–1 Mya (Cantagrel et al. 1984, Mitchell-Thomé 1985, Ancochea et al. 1990, Coello et al. 1992). The island of Tenerife is located roughly at the center of the line drawn through the archipelago. Tenerife is both the biggest (2058 km<sup>2</sup>) and the highest (3717 m) island in the archipelago.

Elevation together with trade winds play important ecological roles on oceanic islands, especially at tropical and subtropical latitudes. They are both responsible for the presence and distribution of the different ecological zones. In the particular case of the Canaries, the joint effect of the humid and cool NE trade winds, between altitudes of 400–1200 m, and the dry

trade winds from the NW, above 2000 m, cause a temperature inversion. In this area, a nearly permanent cloud belt is formed. Consequently, strong ecological segregation is observed between northern, more humid, and southern, dryer slopes. Five major ecological zones can be recognized on northern slopes of the islands. The first, from the seashore to up to 250 m, is characterized by the presence of dry-arid subtropical shrubs. The second, from 250–600 m, features humid to semi-arid tropical shrubs and woods. The third, from 600–1000 m, is covered by the cloud belt and features a typical subtropical wood, the so-called laurel forest. In the fourth, from 1000–2000 m, an endemic pine forest occurs. Finally, dry subalpine shrub is present from 2000 m to the top. Southern slopes lack a laurel forest zone and transition between sub-arid shrubs and the pine forest takes place at higher elevation.

Apart from these climatic-related ecosystems, an additional ecological zone is present in volcanic islands: the hypogean environment. The subterranean environment in the Canaries is represented by both lava tubes and the MSS (mesocavernous shallow stratum) (Juberthie et al. 1980, 1981; Oromí et al. 1986; Medina 1991). Due to their short lifespan, lava tubes are found only in areas of the islands with a relatively recent pahoehoe-like basaltic volcanism. This explains the lack of tubes in the islands of La Gomera and their scarcity in Gran Canaria and most of Fuerteventura. However, even in the absence of caves, a very rich underground environment, in the form of shallow, intermediate-sized, interconnected voids, is present in all the islands.

Before the present study 29 endemic species of *Dysdera* had been reported from Tenerife, by far the most species-rich island in the archipelago. These species were: *D. ambulotenta* Ribera et al. 1985 (♂, ♀; one locality); *D. brevisetae* Wunderlich 1991 (♂, single specimen); *D. brevispina* Wunderlich 1991 (♂, single specimen); *D. chioensis* Wunderlich 1991 (♀, one locality); *D. cribellata* Simon 1883 (♂, ♀); *D. curvisetae* Wunderlich 1987 (♂, single specimen); *D. esquiveli* Ribera & Blasco 1986 (♂, ♀); *D. gibbifera* Wunderlich 1991 (♂, ♀); *D. gollumi* Ribera & Arnedo 1994 (♀, one locality); *D. iguanensis* Wunderlich 1987 (♂, ♀); *D. inaequuscapillata* Wunderlich 1991 (♂, ♀); *D. insulana* Simon

1883 (♂, ♀; one locality); *D. labradaensis* Wunderlich 1991 (♀, one locality); *D. levipes* Wunderlich 1987 (♂, ♀); *D. medinae* Wunderlich 1991 (♂, ♀); *D. minutissima* Wunderlich 1991 (♂, single specimen); *D. montanetensis* Wunderlich 1991 (♂, single specimen); *D. moquinalensis* Wunderlich 1991 (♂, single specimen); *D. obscuripes* Wunderlich 1991 (♂, ♀); *D. pergrada* Wunderlich 1991 (♂, ♀; one locality); *D. propinqua* Ribera et al. 1985 (♂, single specimen); *D. pseudopergrada* Wunderlich 1991 (♂, ♀); *D. rugichelis* Simon 1907 (♂, single specimen in Tenerife); *D. taibaensis* Wunderlich 1991 (♂, single specimen); *D. teideensis* Wunderlich 1991 (♂, ♀); *D. teneriffensis* Strand 1908 (♀; single specimen, lost); *D. unguimmanis* Ribera et al. 1985 (♀, single specimen); *D. vilaftorensis* Wunderlich 1991 (♂, single specimen) and *D. volcania* Ribera et al. 1985 (♂, ♀; one locality) (Bösenberg 1895; Strand 1908; Denis 1941, 1953; Schmidt 1975; Ribera et al. 1985; Wunderlich 1987, 1991; Ribera & Arnedo 1994; Arnedo et al. 1996; Arnedo & Ribera 1997). Six of these species displayed morphological adaptations to the hypogean environment and were considered to be true troglobites. With a single exception (*Dysdera ratonensis* Wunderlich 1991 from La Palma), the lava tubes of Tenerife hold all troglomorphic *Dysdera* documented so far in the Canaries.

## METHODS

The current study was based on the adoption of the so-called 'diagnosability' (Baum 1992) phylogenetic species concept (Nixon & Wheeler 1990, 1992; Wheeler & Nixon 1990, Davis & Nixon 1992). Species are recognized as the most exclusive set of populations that display a unique combination of character-states, when semaphoronts are compared (Davis & Nixon 1992). This concept was selected because it is easily applicable in practice, it avoids any reference to processes, and is fully compatible with a phylogenetic framework. However, this definition is not free of theoretical problems (Frost & Kluge 1994) and has been considered to be excessively restrictive. In addition, in the present approximation, only morphological characters were taken into account, which has probably resulted in an underestimation of the total number of species. Additional studies considering molecular, eco-

logical or behavioral characters would be necessary in order to recover the total amount of diversity of the genus.

The first stage in the assessment of the taxonomic status of the Tenerifean species was to gather a large number of specimens (350), which were made available from scientific institutions, various personal collections, and three collection expeditions to the island by the authors. The following colleagues and museum kindly supplied material for the present study: Dr. E. Enghoff from the Zoologisk Museum of Copenhagen (ZMK), R. García 'Felo' (S/C de la Palma, Canary Islands) (RG), F. Gasparo (Trieste, Italy) (FG), Mr. P.D. Hilliard from the Natural History Museum of London (BMNH), Dr. M. Grasshoff from the Forschungsinstitut und Naturmuseum Senckenberg (SMF), Dr. P. Oromí from the Universidad de La Laguna (UL), Dr. G. Ortega from the Museo de Ciencias Naturales de Santa Cruz de Tenerife (MCNT), Dr. C. Rollard from the Muséum National d'Histoire Naturelle de Paris (MNHN) and J. Wunderlich (Straubenhardt, Germany) (JW). The material provided by the authors' expeditions is stored at the collection of Arachnids of the University of Barcelona, Spain (UB).

Characters were investigated under a Wild Heerbrugg (12–100×) dissecting microscope. Female vulva (= endogyne, Mcheidze 1972) was removed and muscle tissues digested using a KOH (35%) solution before observation. Male bulbi and spinnerets were removed, cleaned by means of ultrasound and examined using a HITACHI S-2300 scanning electron microscope at 10–15 Kv. All measurements are in millimeters. Somatic morphology measurements were taken using an ocular micrometer in the dissecting microscope. Characters examined together with their diagnostic resolution have been discussed elsewhere (Arnedo et al. 1996). All characters were recorded in DELTA format (Dallwitz 1980; Dallwitz et al. 1993).

**Terminology.**—Leg spination was recorded for each segment using the format of Arnedo et al. (1996). Only spines present on femorae, patellae and tibiae were considered. In femora, spines are usually arranged in one or two (anterior and posterior) rows parallel to the segment. The number of rows and spines per row were recorded (In Tables 2–16, the number of spines in each row were separated

by a slash). In patellae, the number of spines and their position (ventral or dorsal) was coded. Tibiae usually show the most complex spination pattern. For each tibia, the number of spines was recorded from four zones (hereafter referred as 'bands'): proximal, medial-proximal, medial-distal and distal. For coding purposes, the number of spines on the frontal, medial and posterior regions were separated by points. In the descriptions (intra-individual variation), hyphens separate the number of spines on each side of the body if different. In the tables (intraspecific variation) hyphens separate the minimum and maximum number of spines observed in any specimen. Between 6–10 individuals were examined from each species whenever possible.

Structures of male bulb and female vulva were mostly named after Deeleman-Reinhold & Deeleman (1988), with the addition of several features particular to Canarian *Dysdera* (Arnedo et al. 1996; Arnedo & Ribera 1997). Nevertheless, some new characters from the female vulva have been added or have been redefined and deserve further considerations. The vulva of the genus *Dysdera* is divided into two major diverticles: an anterior diverticle and a posterior one. They are separated by the epigastric furrow at the ventral side, and the oviduct opening at the dorsal one. The posterior diverticle is mostly membranous, with the single exception of the transversal bar. This is located at the anterior dorsal side and holds a frontal projection ('bursal valve', V) that closes the oviduct openings. On the other hand, most of the anterior diverticle is usually sclerotized. The most conspicuous structure is a T-shaped spermatheca (S) located at the ventral side of the most anterior margin. The medial lateral margins of the anterior diverticle are invaginated forming two different pouches: a dorsal pouch, which corresponds to the so-called 'dorsal arch' (DA) (Deeleman-Reinhold & Deeleman 1988) and a ventral one, hereafter referred as 'ventral arch' (VA). The DA is usually completely sclerotized. The dorsal side of the DA locks the V and is called the 'dorsal fold' (DF) (Arnedo et al. 1996). The fold that separates both diverticles is named the 'major fold' (MF), to differentiate it from several additional folds that are sometimes found on the DA lateral borders. The development and sclerotization degree of the MF are highly variable. In some

Table 1.—Abbreviations used in text and figures (Figs. 4–12).

<i>Female genitalia</i>	<i>Male copulatory bulb</i>
DA = dorsal arch	T = tegulum
DF = dorsal fold	DD = distal division
MF = major fold	IS = internal sclerite
S = spermatheca	ES = external sclerite
TB = transversal bar	DH = distal haematodoca
V = bursal valve	C = crest
VA = ventral arch	AC = additional crest
AVD = additional ventral diverticle	LF = lateral fold over L, between internal and external sclerites
<i>Eyes</i>	L = lateral sheet
AME = anterior medial eyes	AL = additional lateral sheet at back internal border
PME = posterior medial eyes	P = posterior apophysis
PLE = posterior lateral eyes	
<i>Cheliceral teeth</i>	<i>Spinnerets</i>
B = basal tooth	ALS = anterior lateral spinnerets
M = medial tooth	PMS = posterior medial spinnerets
D = distal tooth	PLS = posterior lateral spinnerets
	MS = major ampullate gland spigot
	PS = polar pyriform gland spigot

continental *Dysdera* species, the MF almost entirely isolates the DA from the VA. The margins of the MF may be markedly separated from each other or stuck together forming an internal rim. The VA exhibits a wide range of sclerotization levels, from mostly sclerotized to completely membranous. In most of the Canarian representatives, an additional ventral diverticle (AVD) in the VA has been observed. The AVD is recognized by an internal rim ventral to the MF and by its own external sclerotization, usually tooth shaped. Spinnerets and their associated spigot glands were assigned after Platnick et al. (1991). See Table 1 for a complete list of abbreviations.

#### FAMILY DYSDERIDAE

##### Genus *Dysdera* Latreille 1804

*Note:* An excellent and thorough diagnosis and description of the genus *Dysdera* can be

found in Deeleman-Reinhold & Deeleman (1988).

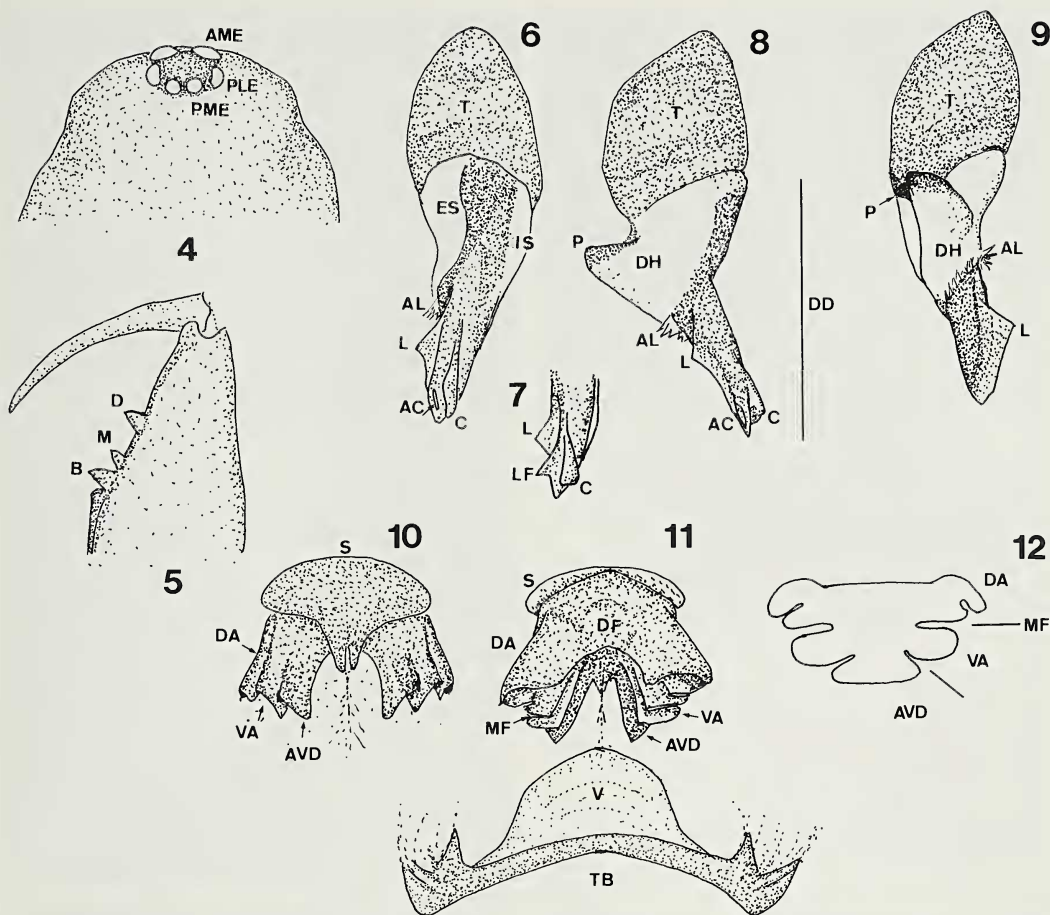
##### *Dysdera ambulotenta* Ribera, Ferrández & Blasco 1985 Figs. 13–24, Table 2

*Dysdera ambulotenta* Ribera, Ferrández & Blasco 1985: 54–57, fig. 1 [♂, ♀]. Holotype male and paratype female (allotype) from Cueva del Viento-Sobrado, El Amparo, Icod de los Vinos, Tenerife, Canary Islands; 14 May 1981, J.L. Martín leg.; ♂ (T-CS-17), ♀ (T-CS-18). Stored at UL. Examined. Wunderlich 1991: 284–287.

**Diagnosis.**—*Dysdera ambulotenta* can be distinguished from all other Canarian *Dysdera* species, except *D. labradaensis*, by its large size (carapace > 6.5 mm) and remarkable eye reduction. It differs from *D. labradaensis* (male unknown) by complete absence of both the posterior lateral (PLE) and posterior me-

Table 2.—Intraspecific spination variability of *Dysdera ambulotenta*.

	Proximal	Medial-proximal	Medial-distal	Distal
Tibia 3 dorsal	1.0-2.1	1.0-2.0-1	0	1.0.1
Tibia 4 dorsal	0-1.0.0-1	1.0-3.1	0-1.0-3.0-1	1.0.1
Tibia 3 ventral	1.1-3.1	1.1-2.1	0	1.0.0-1
Tibia 4 ventral	1.1-2.1	1.1-2.1	0-2.0-2.1-2	0-1.0-2.1
	Number of rows		Number of spines	
Femur 3 dorsal		2	0-3/0-1	
Femur 4 dorsal		2	0-4/0-4	



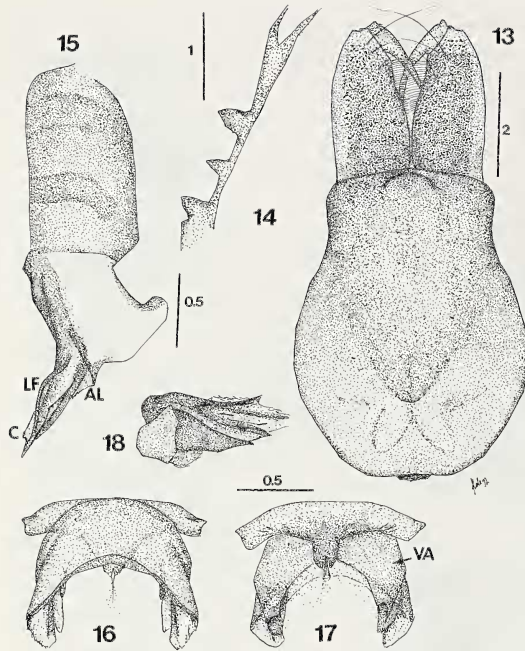
Figures 4–12.—Diagrams showing the characters included in the abbreviations list (Table 1). 4, Carapace frontal region, dorsal view; 5, Left chelicera, ventral view; 6, Right bulb, frontal view; 7, Right bulb distal tip, frontal view; 8, Bulb, external view; 9, Bulb, posterior view; 10, Vulva, ventral view; 11, Vulva, dorsal view; 12, Vulva, transverse section.

dial eyes (PME), lack of spines on legs 1 and 2 and absence of an additional ventral diverticle (AVD) in the vulva (Fig. 17). In both sexes absence of a polar spigot (PS) in the anterior lateral spinnerets (ALS) is unique to this species (Fig. 23).

**Description.**—*Holotype male*: Figs. 13–15, 19–22. Carapace (Fig. 13) 7.35 mm long; maximum width 5.6 mm; minimum width 3.78 mm. Reddish-orange, frontally darker, becoming lighter towards back; slightly foveate at borders, slightly wrinkled with a fine-textured granular surface primarily at the anterior end. Frontal border roughly straight, from  $\frac{1}{2}$  to  $\frac{3}{5}$  carapace length; anterior lateral borders convergent (backwards long, parallel); rounded at maximum dorsal width point, back lateral borders rounded; back margin wide,

straight PME, PLE lost; AME markedly reduced; AME diameter 0.09 mm; AME separation 0.936 mm. Labium trapezoid-shaped, base wider than distal part; longer than wide at base; semicircular groove at tip. Sternum dark orange, frontally darker, becoming lighter towards back; very slightly wrinkled, mainly between legs, frontal border; uniformly covered in slender black hairs.

Chelicerae (Fig. 14) 4.41 mm long, about  $\frac{2}{5}$  of carapace length in dorsal view; fang medium-sized, 2.8 mm; basal segment dorsal side completely covered with piligerous granulations (small, densely), ventral side smooth. Chelicera inner groove medium-size, about  $\frac{2}{5}$  cheliceral length; armed with three teeth and lamina at base;  $D > B > M$  (large teeth; D, B not very different); D round, located rough-



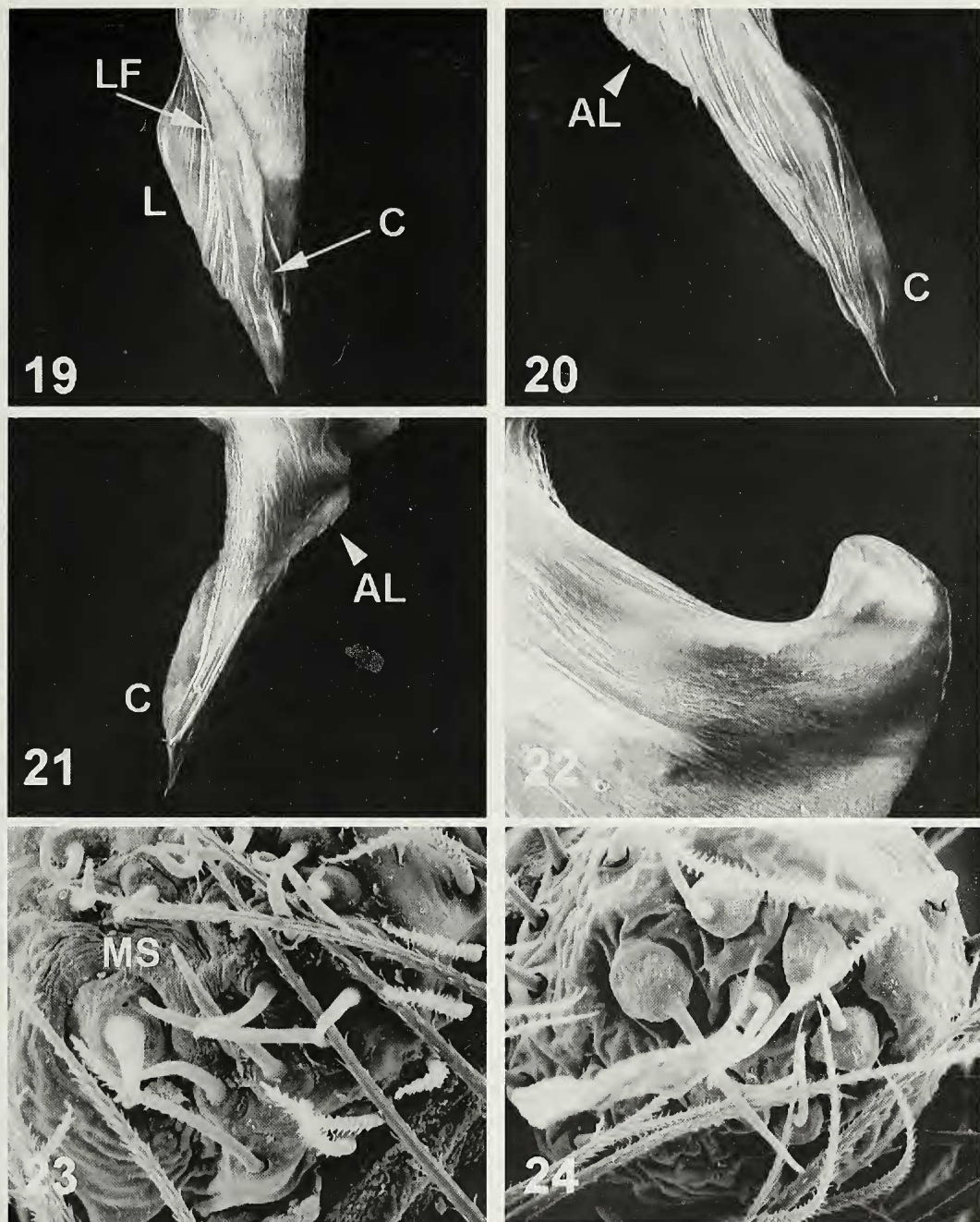
Figures 13–18.—*Dysdera ambulotenta*. 13, Carapace, dorsal; 14, Left chelicera, ventral; 15, Left male bulb, external; 16, Vulva, dorsal; 17, Vulva, ventral; 18, Vulva, lateral. Scale bars in mm.

ly at center of groove; B close to basal lamina; M at middle of B and D. Legs orange. Lengths of male described above: fe1 6.6 mm (all measurements in mm); pa1 4.3; ti1 6.3; me1 5.4; ta1 1.2; total 23.8; fe2 6.3; pa2 4; ti2 6.2; me2 5.2; ta2 1.2; total 22.9; fe3 5.2; pa3 2.9; ti3 3.8; me3 4.5; ta3 1.3; total 17.7; fe4 6.3; pa4 3.4; ti4 5.3; me4 6; ta4 1.4; total 22.4; relative length:  $1 > 2 > 4 > 3$ ; palp: fe 3.5; pa 2; ti 2; ta 1.9; total 9.4. Spination: palp, leg1, leg2 spineless. Fe3 dorsal spines in two rows: anterior 3 (distal); posterior 1 (proximal); ti3 dorsal spines arranged in three bands: proximal 1.2.1; medial-proximal 1.1-2.1; distal 1.0.1; ti3 ventral spines arranged in three bands: proximal 1-0.3-2.1; medial-proximal 1.3-2.1; distal 1.0.1; with two terminal spines. Fe4 dorsal spines in two rows: anterior 4-2; posterior 3-2; ti4 dorsal spines arranged in four bands: proximal 1-0.0.1-0; medial-proximal 1.2.1; medial-distal 1.3-2.1; distal 1.0.1; ti4 ventral spines arranged in four bands: proximal 1.2-1.1; medial-proximal 1.2.1; medial-distal 1.2-1.1; distal 1.1-0.1; with two terminal spines. Dorsal side of frontal legs with a fine-textured piligerous granular surface; ventral side of palp smooth; posterior legs

densely covered with short hairs. Claws with more than 15 teeth, slender, length twice claw width. Abdomen 10.5 mm long; whitish; cylindrical. Abdominal dorsal hairs 0.027 mm long (short); medium-sized, roughly straight, not compressed, blunt, tip enlarged; uniformly, thickly distributed.

Male bulb (Fig. 15): T as long as DD; external distal border straight; internal sloped backwards. DD bent about  $45^\circ$  in lateral view; internal distal border not expanded. ES wider, more sclerotized than IS; IS continuous to tip. DD tip (Figs. 19–21) straight in lateral view. C present, long; distal end on DD internal tip; well-developed; located far from DD distal tip; proximal border continuously decreasing; distal border markedly sloped, upper tip not projected, pointed; external side hollowed. AC absent. LF present; distally not projected; poorly developed. L well-developed; external border not sclerotized, laterally slightly folded, distal border divergent, continuous. AL present, well-developed; proximal border in posterior view fused with DH. P (Fig. 22) fused to T; markedly sloped on its proximal part, perpendicular on distal; lateral length as long as or longer than T width; ridge present, perpendicular to T, not expanded; upper margin smooth; not distally projected; back margin not folded.

*Paratype female*: Figs. 16–18, 23, 24. All characters as in male except: Carapace 7.21 mm long; maximum width 5.6 mm; minimum width 3.64 mm. AME separation 1.16 mm. Chelicerae 4 mm long; fang 3.22 mm. Legs orange. Lengths of female described above: fe1 6.6 mm (all measurements in mm); pa1 4.3; ti1 6.2; me1 5.4; ta1 1.3; total 23.8; fe2 6.1; pa2 4.1; ti2 6.1; me2 5.4; ta2 1.3; total 23; fe3 5.2; pa3 3; ti3 3.9; me3 4.8; ta3 1.2; total 18.1; fe4 6.5; pa4 3.5; ti4 5.2; me4 6.3; ta4 1.5; total 23; relative length  $1 > 2 = 4 > 3$ ; palp: fe 4; pa 2; ti 1.9; ta 2.5; total 10.4. Spination: palp, leg1, leg2 spineless. Fe3 dorsal spines in two rows: anterior 2; posterior 1; ti3 dorsal spines arranged in three bands: proximal 1.0.1; medial-proximal 1.0.1; distal 1.0.1; ti3 ventral spines arranged in three bands: proximal 2-1.2.2-1; medial-proximal 1.3-1.0-1; distal 1.0.1; with two terminal spines. Fe4 dorsal spines in two rows: anterior 1; posterior 2; ti4 dorsal spines arranged in four bands: proximal 1-0.0.1-0; medial-proximal 1.2-0.1; medial-distal 1.3-1.1; distal



Figures 19–24.—*Dysdera ambulotenta*, right male bulb and female spinnerets. 19, DD frontal; 20, DD external; 21, DD internal; 22, P internal view; 23, Right ALS; 24, Right PLS.

1.0.0; ti4 ventral spines arranged in four bands: proximal 1.1.1; medial-proximal 1.1-2.1; medial-distal 0-1.1-0.1; distal 0-1.1-0.1; with two terminal spines.

Abdomen 7 mm long. Abdominal dorsal hairs 0.036 mm long (short); medium thick-

ness, roughly straight, not compressed, blunt, tip enlarged; uniformly, thickly distributed. Vulva (Figs. 16–18) rectangle-like in dorsal view, frontally rounded; slightly wider than long; DF wide. MF well-developed; markedly sclerotized along its extent. VA frontal region



completely sclerotized; posterior region sclerotized except for internal area. AVD absent. S attachment projected under VA; arms as long as DA, slightly curved; tips dorsally projected; neck as wide as arms. TB usual shape. ALS (Figs. 23–24) without PS; remaining piriform spigots no more external than MS, arranged in three rows; 18 piriform gland spigots; PMS, PLS with 5–10 aciniform gland spigots.

**Intraspecific variation.**—Male cephalothorax ranges in length from 7.00–7.35 mm, female from 6.51–7.00 mm. Sometimes carapace lateral margin angled at maximum width point. AME reduction variable, from tiny bright spots to absent. Chelicera relative length from 0.43–0.48. D as large as or slightly larger than B. One male from Los Roques with M distinctly closer to D. In general, cheliceral teeth are large. Spination variability in Table 2.

**Additional material examined.**—**TENERIFE:** *El Sauzal:* Cueva de Labrada-Mechas, 13 March 1982, 1♂ subadult (J.L. Martín, num. 2520 UL). *Icod de los Vinos:* Cueva de Felipe Reventón, 17 March 1984, some remains (J.J. Hernández, num. 2534 UL). Cueva del Viento-Sobrado, 10 December 1982, 1juv. (J.L. Martín, num. 2517 UL); 2 November 1991, 1juv. (J.L. Martín, num. 2518 UL). *La Orotava:* Cueva del Bucio, 27 November 1984, some remains (J.L. Martín & A. Machado, num. 2794 UL); 4 March 1985, 1juv. (J.L. Martín & A. Machado, num. 2532 UL). 1 April 1991, 1♀ (Lucas & Rando, num. 2511 UL). Cueva de los Roques, 11 August 1986, 1♂ (J.L. Martín, num. 2512 UL); 27 October 1991, ? (one chelicera) (C. Ribera, num. 2568 UL); 25 September 1996, 1♀ (P. Oromí, num. 3184 UB).

**Distribution.**—Tenerifean endemic. Exclusively known from lava tubes. It is the most widespread of troglomorphic *Dysdera*.

*Dysdera brevisetae* Wunderlich 1991  
Figs. 25–36

*Dysdera brevisetae* Wunderlich 1991: 289–290, fig. 14–16 [♂]. Holotype male from Monte de las Mercedes, La Laguna, Tenerife, Canary Islands; in II, M. Knösel leg.; num. 37166. Stored at SMF. Examined. —Wunderlich 1991: 284–287.

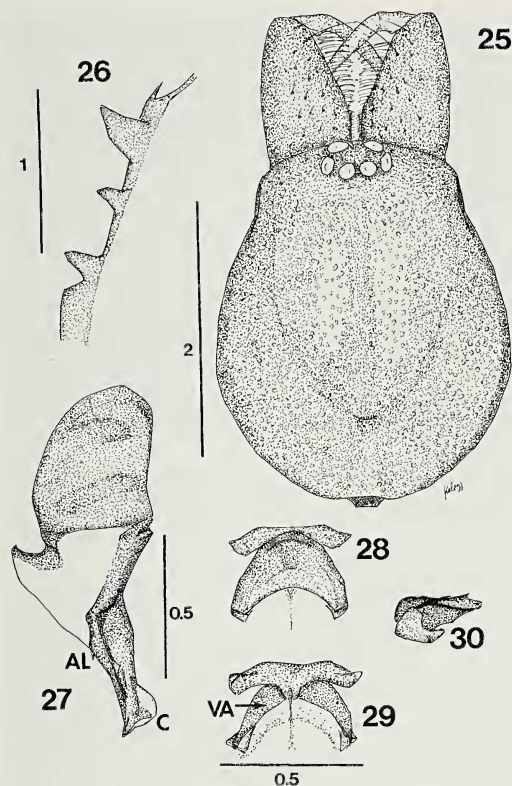
**Diagnosis.**—*Dysdera brevisetae* is distinguished from any other markedly foveate species by its wider carapace frontal border and spineless femora and tibiae. Males differ from the morphologically similar *D. macra* by a

poorly developed but complete bulb lateral sheet (L) (Fig. 31), and both males and females have anterior medial eyes separated by less than  $\frac{2}{3}$  of its diameter from each other, longer chelicera inner groove and cheliceral distal tooth (D) markedly larger than basal one (B) (Fig. 26).

**Description.**—*Holotype male:* Figs. 25–27, 31–34. Carapace (Fig. 25) 3.62 mm long; maximum width 2.51 mm; minimum width 1.84 mm. Dark red, darkened at borders; heavily wrinkled, foveate, with a fine-textured granular surface. Frontal border roughly round, from  $\frac{1}{2}$ – $\frac{3}{5}$  carapace length; anterior lateral borders parallel or slightly divergent; rounded at maximum dorsal width point, back lateral borders rounded; back margin narrow, straight; slightly stepped in lateral view. AME diameter 0.21 mm; PLE 0.21 mm; PME 0.16 mm; AME on edge of frontal border, separated one from another about  $\frac{1}{2}$  of diameter, close to PLE; PME very close to each other, less than  $\frac{1}{4}$  PME diameter from PLE. Labium trapezoid-shaped, base wider than distal part; as long as wide at base (triangle-like); semi-circular groove at tip. Sternum brownish-red, darkened on borders; heavily wrinkled; uniformly covered in slender black hairs.

Chelicerae (Fig. 26) 1.58 mm long, about  $\frac{2}{5}$  of carapace length in dorsal view; fang long, 1.35 mm; basal segment dorsal, ventral side completely covered with piligerous granulations. Chelicera inner groove long, about  $\frac{1}{2}$  cheliceral length; armed with three teeth and lamina at base; D > B = M (B, M small); D trapezoid, located near segment tip; B close to basal lamina; M close to D. Legs orange. Lengths of male described above: fe1 2.4 mm (all measurements in mm); pa1 1.44; ti1 2.14; me1 2; ta1 0.51; total 8.49; fe2 2.23; pa2 1.35; ti2 1.91; me2 1.98; ta2 0.51; total 7.98; fe3 1.79; pa3 1.07; ti3 1.26; me3 1.68; ta3 0.51; total 6.31; fe4 2.19; pa4 1.12; ti4 1.82; me4 2; ta4 0.53; total 7.66; relative length: 1 > 2 > 4 > 3; palp: fe 1.4; pa 0.74; ti 0.74; ta 0.74; total 3.62. Spination: spineless. Dorsal side of frontal legs covered with hairs, lacking a granular surface; ventral side of palp smooth; long, spine-like hairs on posterior ti, fe. Claws with 10–14 teeth, length twice claw width.

Abdomen 3.73 mm long; whitish; cylindrical. Abdominal dorsal hairs 0.045 mm long; medium thickness, roughly straight, not com-



Figures 25–30.—*Dysdera brevisetae*. 25, Carapace, dorsal; 26, Left chelicera, ventral; 27, Right male bulb, external; 28, Vulva, dorsal; 29, Vulva, ventral; 30, Vulva, lateral. Scale bars in mm.

pressed, blunt, tip enlarged; uniformly, thickly distributed.

Male bulb (Fig. 27): T slightly smaller than DD; external, internal distal border sloped backwards. DD slightly bent in lateral view, clearly less than  $45^\circ$ ; internal distal border not expanded. IS, ES equally developed; IS truncated at DD middle part; ES bend markedly sclerotized. DD tip (Figs. 31–33) straight in lateral view. C present, short; distal end on DD internal tip; well-developed; located close to DD distal tip; proximal border sharply decreasing; distal border rounded, hardly stepped, upper tip not projected, rounded; external side hollowed. AC present. LF absent. L poorly developed; external border not sclerotized, laterally slightly folded; distal border divergent, not continuous; upper sheet strongly folded at middle. AL present, very poorly developed; proximal border in posterior view fused with DH. P (Fig. 34) fused to T; per-

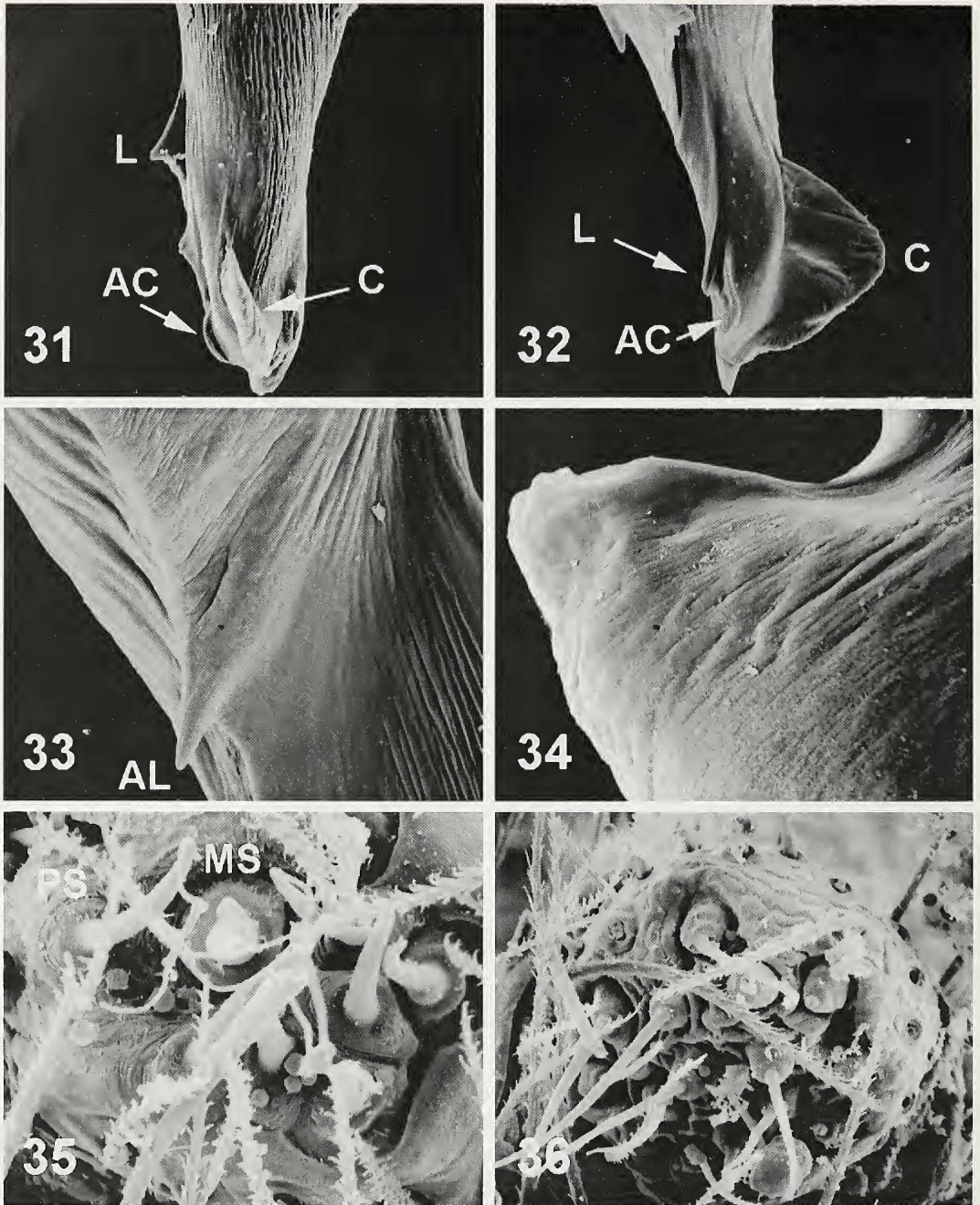
pendicular to T in lateral view; lateral length from  $\frac{1}{3}$ – $\frac{2}{5}$  of T width; ridge present, perpendicular to T, not expanded; upper margin smooth; not distally projected; back margin slightly folded towards internal side.

*Female*: (from El Moquinal, La Orotava, Tenerife; num. 2935, UB) Figs. 28–30, 32, 33. All characters as in male except: Carapace 3.66 mm long; maximum width 2.65 mm; minimum width 1.98 mm. AME diameter 0.23 mm; PLE 0.2 mm; PME 0.16 mm. Sternum dark red. Chelicerae 1.72 mm long; fang 1.4 mm; basal segment proximal dorsal, ventral side scantily covered with piligerous granulations. Legs orange. Lengths of female described above: fe1 2.42 mm (all measurements in mm); pa1 1.54; ti1 2.1; me1 2.05; ta1 0.53; total 8.64; fe2 2.25; pa2 1.44; ti2 1.91; me2 2; ta2 0.53; total 8.13; fe3 1.91; pa3 1.26; ti3 1.38; me3 1.68; ta3 0.51; total 6.56; fe4 2.28; pa4 1.26; ti4 1.91; me4 2.1; ta4 0.53; total 8.08; relative length  $1 > 2 > 4 > 3$ ; palp: fe 1.4; pa 0.79; ti 0.56; ta 0.88; total 3.63.

Abdomen 4.66 mm long; whitish; cylindrical. Abdominal dorsal hairs 0.16–0.18 mm long; thin, curved, compressed, pointed; uniformly, thickly distributed. Vulva (Figs. 28–30) arch-like in dorsal view, frontally rounded; slightly wider than long; DF wide. MF poorly developed. VA frontal region completely sclerotized; posterior region sclerotized at anterior area. AVD hardly visible. S attachment not projected under VA; arms as long as DA, slightly curved; tips dorsally projected; neck as wide as arms. TB usual shape. ALS (Figs. 32–33) with PS; remaining piriform spigots more external than MS, arranged in two rows; 7 + 1 piriform gland spigots; PMS, PLS with 5–10 aciniform gland spigots.

**Intraspecific variation.**—Male cephalothorax ranges in length from 3.62–3.54 mm, female from 3.40–3.66 mm. PLE-PME from  $\frac{1}{5}$ – $\frac{2}{5}$  diameter. Sternum ornamentation somewhat reduced. B may be larger than M. M sometimes closer to B.

**Additional material examined.**—**TENERIFE:** *La Laguna*: Cocomoto, ? February 1989, 1♂ (C. Deniz, num. 2680 UL). El Moquinal, under a bark of *Erica scoparia*, 18 October 1994, 1♀ (P. Oromí, num. 4001 UB). Monte de las Mercedes, 30 January 1989, 1♂ (H. Enghoff, num. 2640 ZMK). *Los Silos*: Monte del Agua, 14 March 1987, 1juv. (H. Enghoff, num. 2669 ZMK); 1 February 1988, 1♀ (J.J. Naranjo, num. 2598 UB); 3 March 1989, 1♀



Figures 31–36.—*Dysdera brevisetae*, right male bulb and female spinnerets. 31, DD frontal; 32, DD external; 33, DD posterior; 34, P external; 35, Right ALS; 36, Right PLS.

(H. Enghoff & M. Baez, num. 2646 ZMK); 3 March 1989, 1♀ (H. Enghoff, num. 2659 ZMK); 18 February 1996, ljuv. (Arnedo & Oromí, num. 3118 UB). *Santa Cruz de Tenerife*: Bailadero, ? November 1993, 1♀ (Arnedo & Ribera, num. 4784 (T21) UB). Cabezo de Tejo, 26 February 1996, 1♀

(Oromí & Emerson, num. 3128 UB). Casas de la Cumbre, 23 February 1996, ljuv. (Oromí & Emerson, num. 3127 UB). Cruz del Carmen, 12 May 1996, 1♂ (M. Naranjo, num. 3145 UB). Vueltas de Taganana, 20 February 1984, 1♂ (García Alayon, num. 2687 UL); May 1995, 1♂ (P. Oromí, num.

Table 3.—Intraspecific spination variability of *Dysdera brevispina*.

	Proximal	Medial-proximal	Medial-distal	Distal
Tibia 3 dorsal	0-1.0-2.1	0	0	1.0.0
Tibia 4 dorsal	1.1-2.1	0	0	1.0-1.1
Tibia 3 ventral	0-1.1-.2.0-1	0	0	1.0.0
Tibia 4 ventral	12-.3.0-1	0	0	1.0.0-1
	Number of rows			Number of spines
Femur 3 dorsal	0			0
Femur 4 dorsal	1			0-1

4181 UB). 29 November 1996, 1♀ (P. Oromí, num. 3189 UB). *Tegueste*: Pedro Alvarez, 19 February 1997, 1♂ (B. Emerson, num. 3204 UB; 20 February 1997, 1♂, (P. Oromí, num. 3205 UB).

**Distribution.**—Tenerifean endemic. Abundant species known from several localities restricted to Anaga and Teno massifs.

**Comments.**—Originally known from a single male specimen, this species has been extensively collected in Tenerife.

*Dysdera brevispina* Wunderlich 1991

Figs. 37–48, Table 3

*Dysdera brevispina* Wunderlich 1991: 289–290, figs. 17–19 [♂]. Holotype male from Cueva de Felipe Reventón, Icod de los Vinos, Tenerife, Canary Islands; 23 March 1984, A. Machado leg.; num. T-FR-97. Stored at UL. Examined. -Wunderlich 1991: 284–287.

*D. moquinalensis* Wunderlich 1991: 301, figs. 65–68 [♂]. El Moquinal, La Laguna, Tenerife, Canary Islands; 1♂; 20/4/90, P. Oromí leg.; Stored at UL. Examined. New synonymy.

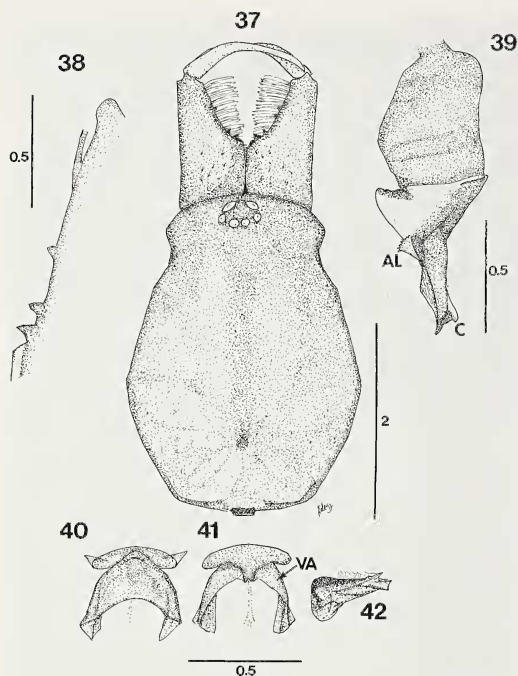
*D. vilaflorensis* Wunderlich 1991: 310–311, figs. 124–125 [♂]. MSS-6, Barranco del Chorrillo, Vilaflor, Tenerife, Canary Islands; 1♂; 15 May 1990, A.L. Medina leg.; Stored at UL. Examined. New synonymy.

**Diagnosis.**—*Dysdera brevispina* is distinguished from most of the Canarian *Dysdera* species by its smooth carapace and by the cheliceral basal tooth (B) being the largest (Fig. 38). Males and females differ from the eastern Canary Islands endemics by lack of thick and lanceolate abdominal hairs, from *D. chioensis* and *D. unguimmanis* by absence of eye reduction and from from *D. guayota* new species by absence of spines on frontal legs. Males distinguished from *D. insulana* by lacking medial fold in bulb lateral sheet (L) (Fig. 43), and both males and females by presence

of cheliceral granulation and distinctive spination pattern (Table 3).

**Description.**—*Holotype male*: Figs. 37–39, 43–47. Carapace (Fig. 37) 3.63 mm long; maximum width 2.7 mm; minimum width 1.68 mm. Brownish-orange, darkened at borders; slightly foveate at borders, slightly wrinkled and a black fine-textured granular surface mostly at the anterior end. Frontal border roughly round, from  $\frac{1}{2}$ – $\frac{3}{5}$  carapace length; anterior lateral borders slightly convergent; rounded at maximum dorsal width point, back lateral borders straight; back margin wide, straight. AME diameter 0.16 mm; PLE 0.14 mm; PME 0.12 mm; AME on edge of frontal border, separated one from another about 1 diameter or more, close to PLE; PME very close to each other, about  $\frac{1}{2}$  PME diameter from PLE. Labium trapezoid-shaped, base wider than distal part; longer than wide at base; semicircular groove at tip. Sternum brownish-orange, darkened on borders; very slightly wrinkled, mainly between legs, frontal border; uniformly covered in slender black hairs.

Chelicerae (Fig. 38) 1.56 mm long, about  $\frac{2}{5}$  of carapace length in dorsal view; fang long, 1.35 mm; basal segment proximal dorsal side scanty covered with piligerous granulations. Chelicera inner groove medium-size, about  $\frac{2}{5}$  cheliceral length; armed with three teeth, lamina at base; additional tooth on left chelicera;  $B > D = M$  (D, M markedly small); D triangular, located roughly at center of groove; B close to basal lamina; M close to B. Legs pale yellow. Lengths of male described above: fe1 3.45 mm (all measurements in mm); pa1 2.19; ti1 3.12; me1 2.93; ta1 0.6; total 12.29; fe2 3.03; pa2 1.96; ti2 2.79; me2 2.7; ta2 0.6; total 11.08; fe3 3.12; pa3 1.4; ti3 1.72; me3 2.23; ta3 0.56; total 9.03; fe4 3.68; pa4 1.86;



Figures 37–42.—*Dysdera brevispina*. 37, Carapace, dorsal; 38, Left chelicera, ventral; 39, Right male bulb, external; 40, Vulva, dorsal; 41, Vulva, ventral; 42, Vulva, lateral. Scale bars in mm.

ti4 2.65; me4 3.26; ta4 0.65; total 12.1; relative length:  $1 > 4 > 2 > 3$ ; palp: fe 1.72; pa 0.84; ti 0.93; ta 0.93; total 4.42. Spination: palp, leg1, leg2 spineless. Fe3 dorsal spineless; ti3 dorsal spines arranged in two bands: proximal 1.1-0.1; distal 1.0-0; ti3 ventral spines arranged in two bands: proximal 2-1.3-0.2-1; distal 1.0-1.1; with two terminal spines. Fe4 dorsal spineless; ti4 dorsal spines arranged in two bands: proximal 1.1-0; distal 1.0-0; ti4 ventral spines arranged in two bands: proximal 1.3-2.0; distal 1.0-0; with two terminal spines. Dorsal side of frontal legs smooth; ventral side of palp covered with hairs, lacking small a granular surface. Claws with 10–14 teeth; hardly larger than claw width.

Abdomen 4.52 mm long; whitish; cylindrical. Abdominal dorsal hairs 0.018–0.027 mm long (small); medium thickness, roughly straight, not compressed, blunt, tip not enlarged; uniformly, scantily distributed.

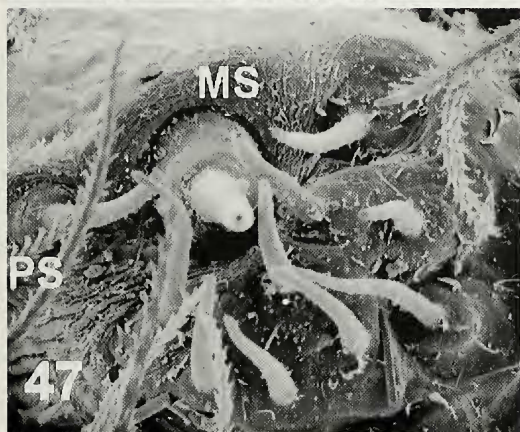
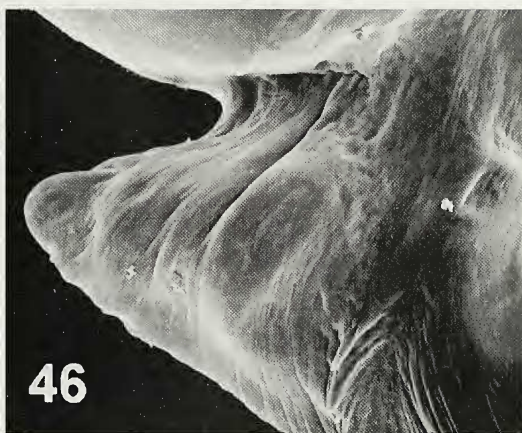
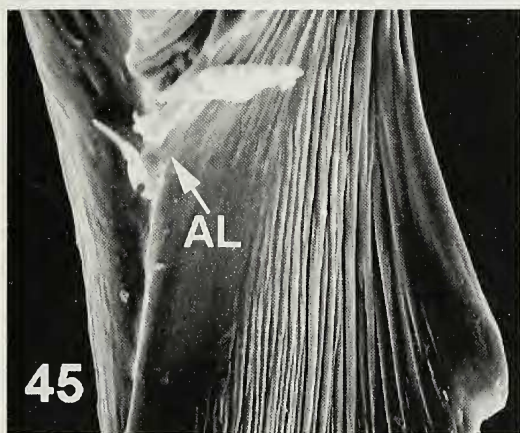
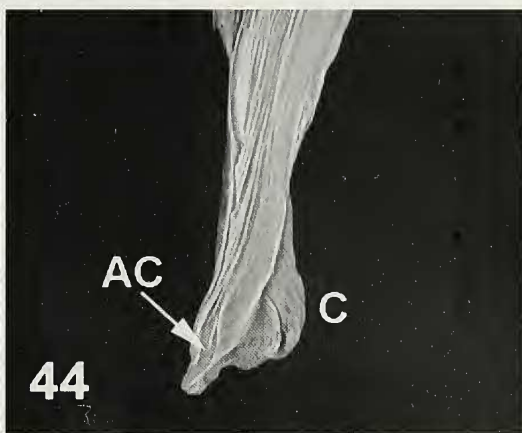
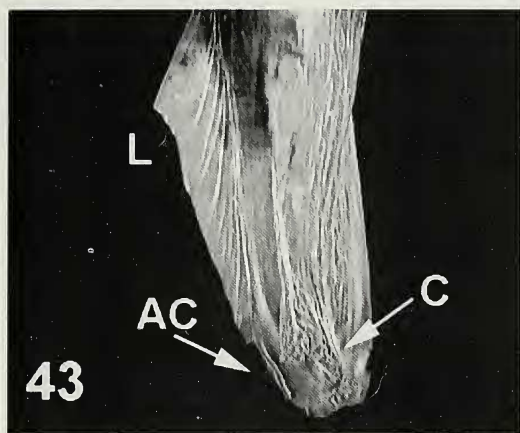
Male bulb (Fig. 39): T slightly smaller than DD; external, internal distal border sloped backwards. DD slightly bent in lateral view, clearly less than  $45^\circ$ ; internal distal border not

expanded. ES more sclerotized than IS; IS truncated at DD middle part. DD tip (Figs. 43–45) straight in lateral view. C present, short; distal end on DD internal tip; well-developed; located close to DD distal tip; proximal border sharply decreasing; distal border stepped, upper tip not projected, pointed; external side hollowed. AC present. LF absent. L well-developed; external border not sclerotized, laterally slightly folded; distal border divergent, continuous. AL present, very poorly developed; proximal border in posterior view toothed. P (Fig. 46) fused to T; perpendicular to T in lateral view; lateral length from  $\frac{2}{5}$ – $\frac{1}{2}$  of T width; ridge present, perpendicular to T, not expanded; upper margin slightly toothed, mainly on external side, on its distal part, very few teeth; not distally projected; back margin not folded.

*Female*: (from Cueva Felipe Reventón, Icod de los Vinos, Tenerife; num. 2744, UL). Figs. 40–42, 47, 48. All characters as in male except: Carapace 2.98 mm long; maximum width 2.37 mm; minimum width 1.44 mm. Brownish-orange, uniformly distributed. AME diameter 0.12 mm; PLE 0.11 mm; PME 0.09 mm; PME about  $\frac{3}{5}$  PME diameter from PLE.

Chelicerae 1.3 mm long; fang 1.21 mm Leg lengths of female described above: fe1 3.45 mm (all measurements in mm); pa1 1.72; ti1 2.33; me1 2.23; ta1 0.51; total 10.24; fe2 2.42; pa2 1.68; ti2 2.19; me2 2.1; ta2 0.56; total 8.95; fe3 1.96; pa3 1.12; ti3 1.44; me3 1.86; ta3 0.51; total 6.89; fe4 2.79; pa4 1.49; ti4 2.33; me4 2.7; ta4 0.6; total 9.91; relative length  $1 > 4 > 2 > 3$ ; palp: fe 1.4; pa 0.6; ti 0.6; ta 0.93; total 3.53. Spination: palp, leg1, leg2 spineless. Fe3 dorsal spineless; ti3 dorsal spines arranged in two bands: proximal 1.0-1.1; distal 1.0-0; ti3 ventral spines arranged in two bands: proximal 2-1.3-0.2-1; distal 1.1-0.1; with two terminal spines. Fe4 dorsal spineless; ti4 dorsal spines arranged in two bands: proximal 0.1-0; distal 1.0-0; ti4 ventral spines arranged in two bands: proximal 1.3-2.0; distal 1.0-0; with two terminal spines.

Abdomen 4.19 mm long; whitish; cylindrical. Abdominal dorsal hairs 0.072–0.09 mm long; medium thickness, curved, compressed, blunt, tip not enlarged; uniformly, thickly distributed. Vulva (Figs. 40–42) arch-like in dorsal view, frontally pointed; as wide as long; DF wide. MF poorly developed. VA frontal region completely sclerotized; posterior re-



Figures 43–48.—*Dysdera brevispina*, right male bulb and female spinnerets. 43, DD frontal; 44, DD external; 45, DD posterior; 46, P external; 47, Right ALS; 48, Right PLS.

gion sclerotized at anterior area; small scale on back border internal part. AVD hardly visible. S attachment not projected under VA; arms as long as DA, straight; tips dorsally projected; neck as wide as arms. TB usual shape. ALS (Figs. 47, 48) with PS; remaining piri-

form spigots more external than MS, arranged in three rows; 9 + 1 piriform gland spigots; PMS, PLS with 10–15 aciniform gland spigots.

**Intraspecific variation.**—Male cephalothorax ranges in length from 2.37–3.63 mm,

Table 4.—Intraspecific spination variability of *Dysdera chioensis*.

	Proximal	Medial-proximal	Medial-distal	Distal
Tibia palp dorsal	0	1.0.0	0	0
Tibia 3 dorsal	0-1.0-2.0-1	0-1.0-2.0-1	0.0-1.0	1.0-1.1
Tibia 4 dorsal	0.0-2.0-1	1.0-3.1	0	1.0-2.1
Tibia 1 ventral	0.0-1.0	0.0-2.0	0	0
Tibia 2 ventral	0	0.1-2.0	0	0
Tibia 3 ventral	0.0-2.0-1	1.2.0-1	0	1.0-1.0-1
Tibia 4 ventral	0-1.2.0-1	0-1.1-2.1	0-1.0-2.0	0-1.0-1.1
Number of spines				
Patella palp dorsal			1-2	
Patella 3 ventral			0-3	
Patella 4 ventral			0-2	
	Number of rows		Number of spines	
Femur 1 frontal	1		1-2	
Femur 2 frontal	1		2-3	
Femur 3 dorsal	2		2-5/1-2	
Femur 4 dorsal	2		1-2/5-9	

female from 2.84–3.47 mm. Carapace frontal lateral borders parallel. Specimens from caves may show certain reduction in eye size. PLE-PME from  $\frac{1}{3}$ – $\frac{2}{5}$  diameter, AME separation from  $\frac{3}{5}$ –1 diameter apart. Occasionally, D as large as B. In general, cheliceral teeth are small; S arms slightly curved. Spination variability in Table 3.

**Additional material examined.**—**TENERIFE:** *Icod de los Vinos:* Cueva Felipe Reventón, ? May 1994, 1 ♀ (M. Arechavaleta, num. 2798 UL); ? May 1994, 1 ♀ (M. Arechavaleta, num. 2806 UL). *Cueva del Viento-Sobrado,* 14 April 1983, 1 ♀ (J.L. Martín, num. 2521 UL). *Santa Cruz de Tenerife:* El Bailadero, 27 November 1993, 1 ♀ (M.A. Arnedo & C. Ribera, num. 2588 UB). *Santa Ursula:* Bco. del Pino, (8411 T/C -T), 21–28 July 1985, 1 ♀ (J.M. Peraza, num. 2616 MCNT).

**Distribution.**—Tenerifean endemic. Known from several localities spread through the island's northern slopes (including Anaga). One single locality on south-western slopes (Vilafior), collected in MSS trap. Unknown from Teno massif.

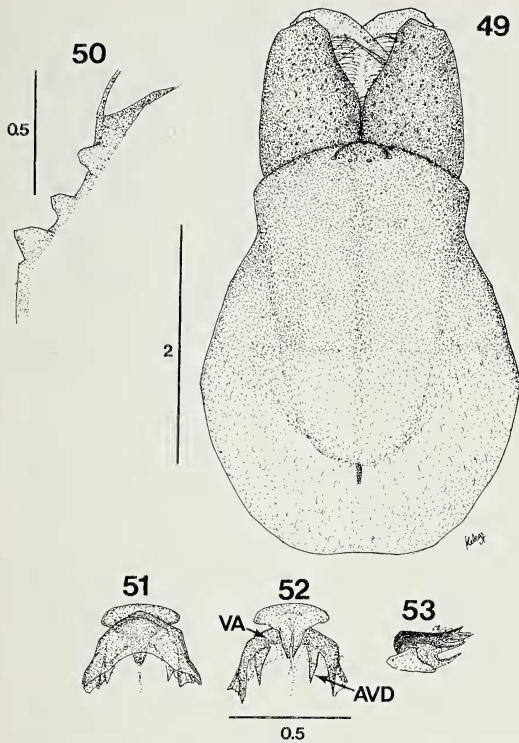
**Comments.**—After examination of the *D. moquinalensis* holotype, no distinctive morphological difference from *D. brevispina*, apart from the highly polymorphic carapace color, could be found. The only difference of *D. vilaflorensis* holotype from *D. brevispina* is an overall smaller size.

*Dysdera chioensis* Wunderlich 1991  
Figs. 49–53, 73, 74, Table 4

*Dysdera chioensis* Wunderlich 1991: 291, figs. 21–23 [♀]. Holotype female from Cueva Grande del Chío, Guía de Isora, Tenerife, Canary Islands; 29 June 1985, G.I.E.T. leg.; num. T-GC-5; Stored at UL. Examined. —Wunderlich 1991: 284–287.

**Diagnosis.**—*Dysdera chioensis* can be distinguished from all other *Dysdera* species, except *D. labradaensis*, by distinct reduction of eye size and presence of spines on frontal legs. Its smaller size and spinated pedipalps distinguish this species from *D. labradaensis*. It differs from the morphologically similar species *D. guayota* new species by having remarkably reduced eyes and presence of spines on palps, and in females by presence of tooth-like expansions in vulva ventral arch (VA) (Figs. 52, 53).

**Description.**—*Holotype female:* Figs. 49–53, 73–74. Carapace (Fig. 49) 3.73 mm long; maximum width 3.03 mm; minimum width 2 mm. Reddish-orange, frontally darker, becoming lighter towards back; smooth with some black granular material mainly at front; hairy, covered with black hairs mainly at lateral and back borders. Frontal border roughly round, from  $\frac{1}{2}$ – $\frac{2}{5}$  carapace length; anterior lateral borders slightly convergent; sharpened at maximum dorsal width point, back lateral bor-



Figures 49–53.—*Dysdera chioensis*. 49, Carapace, dorsal; 50, Left chelicera, ventral; 51, Vulva, dorsal; 52 Vulva, ventral; 53, Vulva, lateral. Scale bars in mm.

ders rounded; back margin wide, slightly bilobed. Eyes markedly reduced in size. AME diameter 0.09 mm; PLE 0.05 mm; PME 0.03 mm; AME separation 1.02 mm; AME-PLE separation 0.05 mm; PLE-PME separation 0.14 mm; PME separation 0.16 mm. Labium trapezoid-shaped, base wider than distal part; longer than wide at base; semicircular groove at tip. Sternum yellowish-orange, darkened on borders; smooth; uniformly covered in slender black hairs.

Chelicerae (Fig. 50) 1.77 mm long, about  $\frac{1}{3}$  of carapace length in dorsal view; fang medium-sized, 1.16 mm; basal segment dorsal side completely covered with piligerous granulations (distally scarce), ventral side smooth. Chelicera inner groove short, about  $\frac{1}{3}$  cheliceral length; armed with three teeth and lamina at base;  $B > D = M$ ; D round, located roughly at center of groove; B close to basal lamina; M close to B. Legs yellow. Lengths of female described above: fe1 2.7 mm (all measurements in mm); pa1 1.68; ti1 2.14; me1 1.91; ta1 0.6; total 9.03; fe2 2.37; pa2 1.63; ti2 2.07;

me2 1.96; ta2 0.6; total 8.63; fe3 2.16; pa3 1.21; ti3 1.68; me3 2.1; ta3 0.65; total 7.8; fe4 2.56; pa4 1.4; ti4 2.1; me4 2.51; ta4 0.65; total 9.22; relative length  $4 > 1 > 2 > 3$ ; palp: fe 1.9; pa 0.74; ti 0.65; ta 0.93; total 4.22. Spination: Palp pa 1, palp ti 1 medial internal. Fe1 1 distal, anterior margin. Fe2: 3-2 distal, anterior margin. Fe3 dorsal spines in two rows: anterior 5; posterior 1 (distal); pa3 spineless; ti3 dorsal spines arranged in two bands: proximal 1.2.1; distal 1.0.1.; ti3 ventral spines arranged in two bands: medial-proximal 1.2.1; distal 1.0.0-1; with two terminal spines. Fe4 dorsal spines in two rows: anterior 1; posterior 7-5; pa4 1 ventral medial; ti4 dorsal spines arranged in three bands: proximal 0.0.0-1; medial-proximal 1.1.1; distal 1.0.1; ti4 ventral spines arranged in three bands: proximal 0.2.0; medial-proximal 1.1.1; medial-distal 0; distal 1.1.1; with two terminal spines. Dorsal side of frontal legs, ventral side of palps covered with hairs, lacking a granular surface. Claws with 10–14 teeth; hardly larger than claw width.

Abdomen 5.12 mm long; whitish; cylindrical. Abdominal dorsal hairs 0.216–0.234 mm long; thin, curved, compressed, pointed; uniformly, thickly distributed. Vulva (Figs. 51–53) arch-like in dorsal view, frontally pointed; slightly wider than long; DF wide. MF well-developed. VA frontal region completely sclerotized; posterior region sclerotized at anterior area; tooth-shaped expansion from internal back border; not joined to lateral sclerotization, slightly shorter than DA lateral margins. AVD clearly recognizable. S attachment projected under VA; arms are shorter than DA, straight; tips not projected; neck as wide as arms. TB usual shape. ALS (Figs. 73, 74) with PS; remaining piriform spigots more external than MS, arranged in two rows; 9 + 1 piriform gland spigots; PMS, PLS with 5–10 aciniform gland spigots.

*Male*: Unknown.

**Intraspecific variation.**—Female cephalothorax ranges in length from 3.36–5.6 mm. D at center of chelicera groove or at tip. Specimens from Los Roques, S arms longer. Spination variability in Table 4.

**Additional material examined.**—**TENERIFE:** *Guía de Isora*: Cueva Grande del Chío, 28 January 1993, 1 juv. (P. Oromí, num. 2545 UL); 21 October 1994, 1 ♀ (Arnedo & Ribera, num. 4821 (T32) UB).



Table 5.—Intraspecific spination variability of *Dysdera cribellata*.

	Proximal	Medial-proximal	Medial-distal	Distal
Tibia 3 dorsal	1.0.1	0-1.0.0	0	1.0.0
Tibia 4 dorsal	1.0.1	0	0	0-1.0.0-1
Tibia 3 ventral	0-1.0-1.0	0	0	0-1.0.0
Tibia 4 ventral	0-1.1.0	0-1.0-1.0	0	0-1.0.0
	Number of rows		Number of spines	
Femur 3 dorsal	0		0	
Femur 4 dorsal	0		0	

*La Orotava*: Cueva de Los Roques, 11 August 1986, 1 juv. (J.L. Martín, num. 2536 UL); November 1995, 1 ♀ (P. Oromí, num. 2965 UB); 27 October 1991, 1 ♀ (C. Ribera, num. 2566 UB); November 1995, 1 ♀ (P. Oromí, num. 2967 UB).

**Distribution.**—Tenerifean endemic. Known from two lava tubes located on dry, south-western slopes.

**Comments.**—Even though several new female specimens have been collected and a new locality has been found for this species, the male remains unknown.

*Dysdera cribellata* Simon 1883

Figs. 54–65, Table 5

*Dysdera cribellata* Simon 1883 (nec. Simon 1907: 258–259, fig. 257 [♂]; incorrect identification); 294–295, fig. 17 [♂]. Type male lost. Type female from Canary Islands, unknown locality; unknown data, M. Verneau leg.; num. B-536; Stored at MNHN. Examined. -Bösenberg 1895: 7. -Reimoser 1919. -Denis 1941: 108. -Schmidt 1973: 360–361. -Arnedo et al. 1996: 243.

*D. medinae* Wunderlich 1991: 299, figs. 57–60 [♂, ♀]. Holotype ♂ and paratype ♀ from Monte de las Mercedes, La Laguna, Tenerife, Canary Islands; in II, M. Knösel leg.; Stored at SMF. Holotype not examined, paratypes examined. New synonymy.

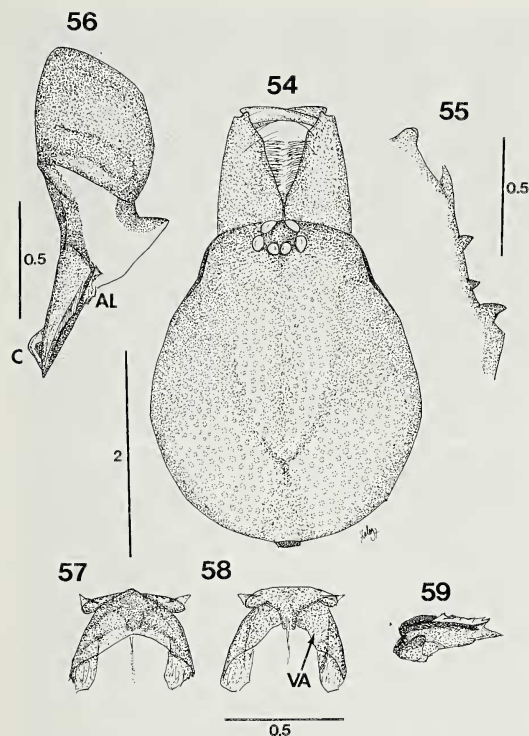
*D. volcania* Ribera, Ferrández & Blasco 1985: 59–61, figs. 3E-F [♀] (♀, non♂). Paratype female (allotype) from Cueva de Felipe Reventón, Icod de los Vinos, Tenerife, Canary Islands; 3 March 1984, P. Oromí leg.; num. T-FR-107. Stored at UL. Examined. Incorrect identification.

**Diagnosis.**—*Dysdera cribellata* can be distinguished from all other Canarian species by its markedly foveate carapace, cheliceral basal tooth (B) being the largest (Fig. 55) and a lack of cheliceral granulation. It can be distinguished from the similar *D. insulana* by its

foveate carapace and distinctive spination pattern (Table 5).

**Description.**—*Male*: (from Sima de la Robada, Santa Cruz de Tenerife, Tenerife; num. 2552, UL). Figs. 54–56, 60–63. Carapace (Fig. 54) 3.22 mm long; maximum width 2.75 mm; minimum width 1.77 mm. Dark red, darkened at borders; heavily foveate, covered with circular depressions, some black granular material mainly at front. Frontal border roughly round, from  $\frac{1}{2}$ – $\frac{3}{5}$  carapace length; anterior lateral borders slightly divergent; rounded at maximum dorsal width point, back lateral borders rounded; back margin wide, straight. AME diameter 0.23 mm; PLE 0.21 mm; PME 0.16 mm; AME on edge of frontal border, separated one from another about  $\frac{2}{5}$  of diameter, close to PLE; PME very close to each other, about  $\frac{1}{3}$  PME diameter from PLE. Labium trapezoid-shaped, base wider than distal part; longer than wide at base; semicircular groove at tip. Sternum dark red, darkened on borders; heavily wrinkled; covered in hairs mainly on margin.

Chelicerae (Fig. 55) 1.35 mm long, about  $\frac{1}{3}$  of carapace length in dorsal view; fang medium-sized, 1.16 mm; basal segment smooth, with no granulations. Chelicera inner groove long, about  $\frac{1}{2}$  cheliceral length; armed with three teeth and lamina at base;  $B > D > M$  (not very different, small); D trapezoid, located roughly at center of groove; B close to basal lamina; M close to B. Legs orange. Lengths of male described above: fe1 2.79 mm (all measurements in mm); pa1 1.86; ti1 2.61; me1 2.51; ta1 0.56; total 10.33; fe2 2.51; pa2 1.63; ti2 2.33; me2 2.28; ta2 0.56; total 9.75; fe3 2; pa3 1.12; ti3 1.49; me3 1.86; ta3 0.51; total 6.98; fe4 2.75; pa4 1.49; ti4 2.33; me4 2.7;



Figures 54–59.—*Dysdera cribellata*. 54, Carapace, dorsal; 55, Right chelicera, ventral; 56, Left male bulb, external; 57, Vulva, dorsal; 58, Vulva, ventral; 59, Vulva, lateral. Scale bars in mm.

ta4 0.6; total 9.87; relative length:  $1 > 4 > 2 > 3$ ; palp: fe 1.4; pa 0.7; ti 0.7. Spination: palp, leg1, leg2 spineless. Fe3 dorsal spineless; ti3 dorsal spines arranged in three bands: proximal 1.0.1; medial-proximal 0–1.0.0; distal 1.0.0; ti3 ventral spines arranged in two bands: proximal 1.1.1; distal 1.0.0; with two terminal spines. Fe4 dorsal spineless; ti4 dorsal spines arranged in two bands: proximal 1.0.1; distal 0.0.1; ti4 ventral spines arranged in two bands: proximal 1.1.0; distal 1.0.0; with two terminal spines. Dorsal side of frontal legs smooth; ventral side of palp covered with hairs, lacking a granular surface. Claws with 10–14 teeth, length twice claw width.

Abdomen 3.68 mm long; whitish; cylindrical. Abdominal dorsal hairs 0.045–0.054 mm long; thin, curved, compressed, pointed; uniformly, thickly distributed.

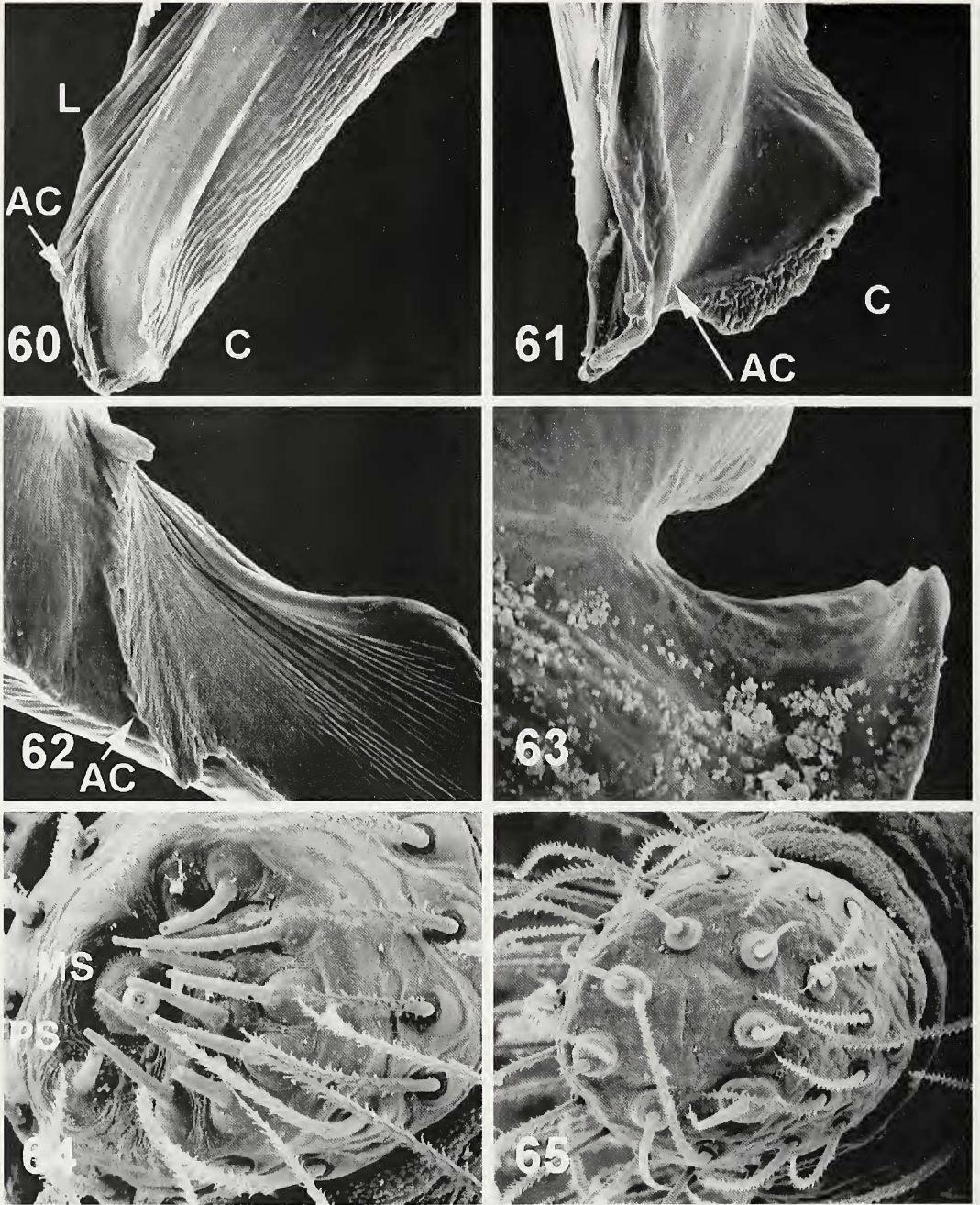
Male bulb (Fig. 56): T slightly smaller than DD; external, internal distal border sloped backwards. DD slightly bent in lateral view, clearly less than  $45^\circ$ ; internal distal border not expanded. ES more sclerotized than IS; IS

truncated at DD middle part. DD tip (Figs. 60–62) straight in lateral view. C present, short; distal end on DD internal tip; well-developed; located close to DD distal tip; proximal border sharply decreasing; distal border stepped, upper tip not projected, sloped; external side hollowed. AC present. LF absent. L well-developed; external border not sclerotized, laterally slightly folded; distal border divergent, not continuous; upper sheet strongly folded at middle. AL present, very poorly developed; proximal border in posterior view toothed. P (Fig. 63) fused to T; perpendicular to T in lateral view; lateral length from  $\frac{2}{5}$ – $\frac{1}{2}$  of T width; ridge present, perpendicular to T, not expanded; upper margin slightly toothed, mainly on external side, on its distal part, few teeth; not distally projected; back margin slightly folded towards internal side.

*Lectotype female*: Figs. 57–59, 64, 65. Carapace 3.82 mm long; maximum width 3.08 mm; minimum width 1.82 mm. Brownish-orange. Anterior lateral borders parallel; rounded at maximum dorsal width point, back lateral borders straight. AME diameter 0.23 mm; PLE 0.21 mm; PME 0.16 mm; AME separated one from another about  $\frac{2}{3}$  of diameter; PME about  $\frac{2}{3}$  diameter from PLE. Sternum orange, uniformly distributed; wrinkled.

Chelicerae 1.67 mm long; fang 1.3 mm. Legs yellow. Lengths of female described above: fe1 2.98 mm (all measurements in mm); pa1 2.05; ti1 2.52; me1 2.47; ta1 0.56; total 10.58; fe2 2.66; pa2 1.86; ti2 2.33; me2 2.28; ta2 0.56; total 9.69; fe3 2.28; pa3 1.3; ti3 1.54; me3 1.91; ta3 0.56; total 7.59; fe4 3.03; pa4 1.63; ti4 2.33; me4 2.84; ta4 0.65; total 10.48; relative length  $1 > 4 > 2 > 3$ ; palp: fe 1.49; pa 0.83; ti 0.74; ta 0.93; total 3.99. Spination: palp, leg1, leg2 spineless. Fe3 dorsal spineless; ti3 dorsal spines arranged in two bands: proximal 1.0.1; distal 1.0.0; ti3 ventral spines arranged in two bands: proximal 0.1.0; distal 1.0.0; with two terminal spines. Fe4 dorsal spineless; ti4 dorsal spines arranged in one band: proximal 1.0.1; ti4 ventral spines arranged in two bands: proximal 1.1.0; distal 1.0.0; with two terminal spines.

Abdomen 4.84 mm long; whitish; cylindrical. Abdominal dorsal hairs 0.054 mm long; thin, curved, compressed, pointed; uniformly, thickly distributed. Vulva (Figs. 57–59) arch-like in dorsal view, frontally pointed; slightly



Figures 60–65.—*Dysdera cribellata*, right male bulb and female spinnerets. 60, DD frontal; 61, DD external; 62, DD posterior; 63, P external; 64, Right ALS; 65, Right PLS.

wider than long; DF wide. MF poorly developed. VA frontal region completely sclerotized; posterior region sclerotized at anterior area. AVD hardly visible. S attachment not projected under VA; arms are slightly shorter than DA, straight; tips not projected; neck as

wide as arms. TB usual shape. ALS (Figs. 64, 65) with PS; remaining piriform spigots more external than MS, arranged in two rows; 11 + 1 piriform gland spigots; PMS, PLS with 5–10 aciniform gland spigots.

**Intraspecific variation.**—Male cephalo-

thorax ranges in length from 3.62–4.66 mm, female from 3.82–3.96 mm. Carapace frontal lateral margins usually parallel. AME separation from  $\frac{2}{5}$ – $\frac{3}{5}$  diameter. PLE-PME from  $\frac{1}{4}$ – $\frac{1}{2}$  diameter. Sternum ornamentation somewhat reduced. Spination variability in Table 5.

**Additional material examined.**—**TENERIFE:** ? : ?, 21 December 1940, 1 ♀ (J. Denis, num. BMNH 1940.12.21.15 BMNH). *La Laguna:* El Moquinal, 28 November 1993, 1 ♀ (Arnedo & Ribera, num. 4794 (T29) UB); 28 November 1993, 1 ♀ (Arnedo & Ribera, num. 4817 (T20) UB). *Santa Cruz de Tenerife:* Cruz del Carmen, 12 May 1996, 2 ♂ (M. Naranjo, num. 3148 UB); 12 May 1996, 1 ♀ (M. Naranjo, num. 3149 UB); 12 May 1996, 1 ♂ (M. Naranjo, num. 3150 UB); 12 May 1996, 1 ♀ (M. Naranjo, num. 3151 UB). Monte de las Mercedes, 24 May 1996, 1 ♂ (P. Oromí, num. 3162 UB); 24 May 1996, 1 ♂ (P. Oromí, num. 3163 UB). Sima de la Robada, 13 February 1992, 1 ♀ (P. Oromí, num. 2514 UL). Taganana, 20 February 1989, 1 ♀ (García Alayon, num. 2599 UL). *Dysdera medinae:* **TENERIFE:** *Santa Cruz de Tenerife:* Monte Aguirre, 4 June 1986, 1 ♂ paratype (C.G. Campos, num. 2741 UL).

**Distribution.**—Tenerifean endemic. Known from several localities spread through the northern slope of the island, including the Anaga and Teno massifs.

**Comments.**—The original male material of this species seems to have been lost. However, the female used in the original description was available for the present study.

The original description of *D. cribellata* (Simon 1883), as well as the remaining *Dysdera* species described in that work, lacked any reference to the locality. In a subsequent paper (Simon 1907) the original locations were assigned using new labelled material. Thus, *D. cribellata* was thought to be present in La Palma. However, after examination of the drawings of the male bulb drawings from both the description and the redescription, they were actually considered to belong to different species (Arnedo et al. 1996). Therefore, the report of this species in La Palma was due to a incorrect identification. The presence of *D. cribellata* in Tenerife has been documented previously (Bösenberg 1895; Denis 1941).

Examination of the *D. medinae* male paratype and the *D. volcania* female allotype did not show any diagnostic character with regard to *D. cribellata*. In both cases misidentifica-

tion was probably due to unavailability of *D. cribellata* type specimens.

*Dysdera crocota* C.L. Koch 1839

*Dysdera crocota* C.L. Koch 1839: 81. -Schmidt 1973: 360–361. -Wunderlich 1991: 284–286, 292–293, figs. 28–31 [♂, ♀]. -Arnedo et al. 1996: 252–253. -Arnedo & Ribera 1997.

*Dysdera inaequuscapillata* Wunderlich 1991: 295, figs. 42–46 [♂, ♀]. Holotype male from Punta Hidalgo, La Laguna, Tenerife, Canary Islands; 14 February 1986, R. Wiss leg.; num. 3934; Stored at UL. Examined. New synonymy.

**Diagnosis.**—*Dysdera crocota* can be distinguished from all other Canarian species, except *D. lancerotensis* Simon 1907, by carapace with a bilobed posterior margin in both sexes, in males by having bulb posterior apophysis (P) not fused to tegulum (T) and a strongly sclerotized apophysis in frontal-distal tip of distal division (DD), and in females by an unsclerotized frontal part of vulva ventral arch (VA). Males and females differ from *D. lancerotensis* by lack of spines on frontal legs (although not always so), males by shape of the bulb frontal distal division tip and posterior apophysis with only two ridges, and females by rectangular shape of vulva dorsal arch (DA) (in dorsal view) and projection of ventral under dorsal arch (in dorsal view).

**Material examined.**—**TENERIFE:** ? : ?, 18/4/84, 1 ♂ 2 ♀ (N.P. Ashmole, num. 2715 UL). *Adeje:* Playa Paraiso, 10–50 m, 24–30 December 1994, 1 ♀ (F. Gasparo, FG). *Buenavista:* Teno Alto, ? March 1994, 1 ♀ (Oromí, num. 2937 UB); 1 juv., (Oromí, num. 4814 (T6) UB); 1 ♂, (Oromí, num. 4819 (T2) UB); 3 ♀ (P. Oromí, num. 4823-5 UB). *El Rosario:* Tabaiba, MSS-1, 9 October 1990, 1 ♀ (A.L. Medina, num. 2774 UL). *El Sauzal:* Around Cueva Labrada, ? November 1993, 5 ♀ (Arnedo & Ribera, num. 4807-11 UB); 1 ♂ (Arnedo & Ribera, num. 4832 (T46) UB); 1 juv. (Arnedo & Ribera, num. 4834 (T49) UB). *El Tanque:* El Tanque, 550m, 26 December 1994, 1 ♀ (F. Gasparo, FG). *Icod de los Vinos:* Altos de El Sobrado, 15 March 1995, 1 ♂, (G. Ortega, MCNT). Icod, 21 December 1982, 1 ♀ (P. Morales, num. 2768 UL). *Garachico:* La Montañeta, 18 February 1996, 8 ♂ 4 ♀ 3 juv. (Arnedo & Oromí, num. 3106-17 UB). *La Laguna:* Co-moto, ? February 1989, 1 ♀ (C. Deniz, num. 2596 UL). El Moquinal, 28 November 1993, 1 ♀ (Arnedo & Ribera, num. 4812 (T5) UB); 23 January 1997, 1 ♀ (P. Oromí, num. 3197 UB). La Laguna, 12 February 1987, 1 ♂ (C.G. Campos, num. 2739 at UL); 28 December 1987, 1 ♂ (C.G. Campos, num. 2688 UL); ? November 1988, 1 juv. (C. Deniz, num. 2597

UL). Las Mercedes, 24 November 1982, 1♂ (A. Santaella, num. 2777 UL); 25 October 1984, 1♂ (C.G. Campos, num. 2740 UL). Los Rodeos, 1♂, 3♀ (R.G. Becerra, num. 2582 RG). Mesa Mota, 4 June 1983, 1♀ (R. Vonk, num. 2773 UL). San Diego, 24 November 1982, 1♀ (E. Caverro, num. 2767 UL). *La Matanza de Acentejo*: La Matanza, 900 m, 2 June 1996, 1♀ (M. Naranjo, num. 3172 UB); 1♂ 1♀, 4juv., (M. Naranjo, 3187 UB). *La Ortava*: Around Cueva del Bucio, 21 October 1994, 1♂ (Arnedo, Ribera & Serra, num. 4003 UB). Aguamansa, La Caldera, 21 October 1994, 2♂ 1♀ (Arnedo, Ribera & Serra, num. 4004-6 UB). *La Victoria de Acentejo*: Las Lagunetas, 4 February 1989, 1♀ (O. Torres, num. 2690 UL); 30 October 1994, 1♀ (P. Oromí, num. 4002 UB); 25 April 1995, 1♀ (P. Oromí, num. 3182 at UB), 1 May 1995, 1♀ (Oromí, num. 4175 (134) UB). *Los Realejos*: Los Realejos, 25 February 1983, 1♀ (A. Fox, num. 2769 UL). *Los Silos*: Erjos, 15 April 1973, 1♀ (J.M. Fernández, num. 2503a UB). *Santa Cruz de Tenerife*: Cruz del Carmen, 12 May 1996, 1juv. (M. Naranjo, num. 3144 UB); 25 January 1997, 1♀ (P. Oromí, num. 3193 UB). Parque de Anaga, 6 February 1988, 1♀ (P. Suárez, num. 2689 UB). *Santa Ursula*: Monte de Santa Ursula, 13 December 1996, 1♀, (P. Oromí, num. 3211 UB). *Santiago del Teide*: Los Gigantes, 28 March 1994, 1♂ (P. Oromí, num. 2816 UB). *D. inaequicapillata*: **TENERIFE**: *La Laguna*: Punta Hidalgo, 14 December 1986, 1 paratype, (R. Wiss, num. 2623 SMF); 14 December 1986, 11juv. (R. Wiss, num. 2731 UL); 23 December 1986, 1♀ (C.G. Campos, num. 2729 UL); 23 December 1986, 2♂ (C.G. Campos, num. 2738 UL). Las Mercedes, ? June 1984, 1♂, (S. Morales, num. 2730 UL).

**Distribution.**—Cosmopolitan species, spread all over the world, probably due to human introduction.

**Comments.**—The presence of *D. crocota* has been documented in all the islands of the archipelago, with the exception of Fuerteventura and Lanzarote. In the Canaries, *D. crocota* is always found in habitats disturbed by human activities. It may suggest that this species has recently been introduced in the archipelago by man.

After examination of several types of *D. inaequicapillata* Wunderlich 1991, they were considered to belong to *D. crocota*. This misidentification is extraordinarily surprising. The original author was aware of the presence of *D. crocota* in the Canaries and even, in the same work, mentioned and drew several characters of *D. crocota*. However, he described *D. inaequicapillata* as a different species on

the basis of the 'uniqueness' of its male bulb in the Canaries.

*Dysdera curvisetae* Wunderlich 1987

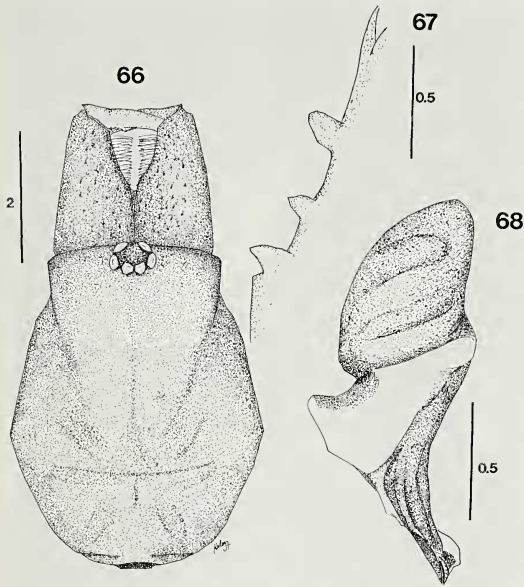
Figs. 66–72

*Dysdera curvisetae* Wunderlich 1987: 291, figs. 12–17 [♂]. Holotype male from small cave at the North coast of San Marcos, Icod de los Vinos, Tenerife, Canary Islands; in VIII, J. Wunderlich leg.; Stored at SMF. Examined. -Wunderlich 1991: 284–287.

**Diagnosis.**—*Dysdera curvisetae* can be distinguished from all other *Dysdera* species, except *D. ratonensis* and *D. verneai* Simon 1883, by its wide frontal border and diamond-shaped carapace (Fig. 66). It differs from *D. ratonensis* and *D. verneai* by its poorly-spined legs and shape and size of male abdominal dorsal hairs.

**Description.**—*Holotype male*: Figs. 66–72. Carapace (Fig. 66) 5.42 mm long; maximum width 4.2 mm; minimum width 2.94 mm. Dark red, frontally darker, becoming lighter towards back; slightly foveate at borders, slightly wrinkled with small black fine-textured granular material mainly at front. Frontal border roughly straight, about  $\frac{3}{5}$  carapace length; anterior lateral borders convergent; sharpened at maximum dorsal width point, back lateral borders straight; back margin wide, straight; transversal suture on dorsal medial posterior surface. AME diameter 0.32 mm; PLE 0.27 mm; PME 0.23 mm; AME on edge of frontal border, separated one from another about  $\frac{2}{3}$  of diameter, close to PLE; PME very close to each other, less than  $\frac{1}{4}$  PME diameter from PLE. Labium trapezoid-shaped, base wider than distal part; longer than wide at base; semicircular groove at tip. Sternum dark red, darkened on borders; very slightly wrinkled, mainly between legs and frontal border; uniformly covered in slender black hairs.

Chelicerae (Fig. 67) 3.08 mm long, about  $\frac{2}{5}$  of carapace length in dorsal view; fang long, 2.1 mm; basal segment dorsal, ventral side completely covered with piligerous granulations (small, dense). Chelicera inner groove medium-size, about  $\frac{2}{5}$  cheliceral length; armed with three teeth and lamina at base;  $D > B > M$  (D, B very similar, all large); D trapezoid, located roughly at center of groove; B close to basal lamina; M at middle of B and D. Legs dark orange-colored. Lengths of male



Figures 66–68.—*Dysdera curvisetae*. 66, Carapace, dorsal; 67, Left chelicera, ventral; 68, Right male bulb, external. Scale bars in mm.

described above: fe1 5.6 mm (all measurements in mm); pa1 3.64; ti1 5.6; me1 5.6; ta1 0.91; total 21.35; fe2 4.41; pa2 3.01; ti2 4.48; me2 2.68; ta2 0.84; total 15.42; fe3 3.64; pa3 1.75; ti3 2.94; me3 3.78; ta3 0.84; total 12.95; fe4 4.4; pa4 2.52; ti4 4.13; me4 5.25; ta4 0.98; total 17.28; relative length: 1 > 4 > 2 > 3; palp: fe 2.8; pa 1.54; ti 1.47; ta 1.26; total 7.07. Spination: palp, leg1, leg2 spineless. Fe3 dorsal spineless; ti3 dorsal spines arranged in two bands: proximal 1.0.1; distal 1-0.0.0; ti3 ventral spines arranged in two bands: proximal 0-1.1.0; distal 1.0.0; with two terminal spines. Fe4 dorsal spines in two rows: anterior 1; posterior 1; ti4 dorsal spines arranged in three bands: proximal 0.0-1.1; medial-proximal 1.1.1; distal 1.0.0; ti4 ventral spines arranged in three bands: proximal 1.1.0; medial-proximal 0.0-1.0-1; distal 1.0.1; with two terminal spines. Dorsal side of frontal legs, ventral side of palp with a fine-textured, granular, piligerous surface. Claws with 10-14 teeth; hardly larger than claw width.

Abdomen 7.7 mm long; cream-colored; cylindrical. Anterior abdominal dorsal hairs 0.126 mm long (large); medium thickness, curved, compressed, blunt, tip not enlarged; uniformly, thickly distributed. Posterior abdominal dorsal hairs 0.036–0.054 mm long; thick, curved, not compressed, tip enlarged,

distally acuminate; uniformly, thickly distributed. Spinneret gland spigot data not available.

Male bulb (Fig. 68): T slightly smaller than DD; external, internal distal border sloped backwards. DD slightly bent in lateral view, clearly less than 45°; internal distal border not expanded. IS and ES equally developed; IS truncated at DD middle part. DD tip (Figs. 69–71) straight in lateral view. C present, short; distal end on DD internal tip; well-developed; located close to DD distal tip; proximal border sharply decreasing; distal border stepped, upper tip not projected, pointed; external side hollowed. AC present. LF absent. L well-developed; external border not sclerotized, laterally slightly folded; distal border divergent, most external part perpendicular, continuous. AL present, very poorly developed; proximal border in posterior view fused with DH. P (Fig. 72) fused to T; perpendicular to T in lateral view; lateral length from 1/2–2/3 of T width; ridge present, perpendicular to T, not expanded; upper margin smooth; not distally projected; back margin not folded.

*Female*: Unknown.

**Intraspecific variation.**—Unknown.

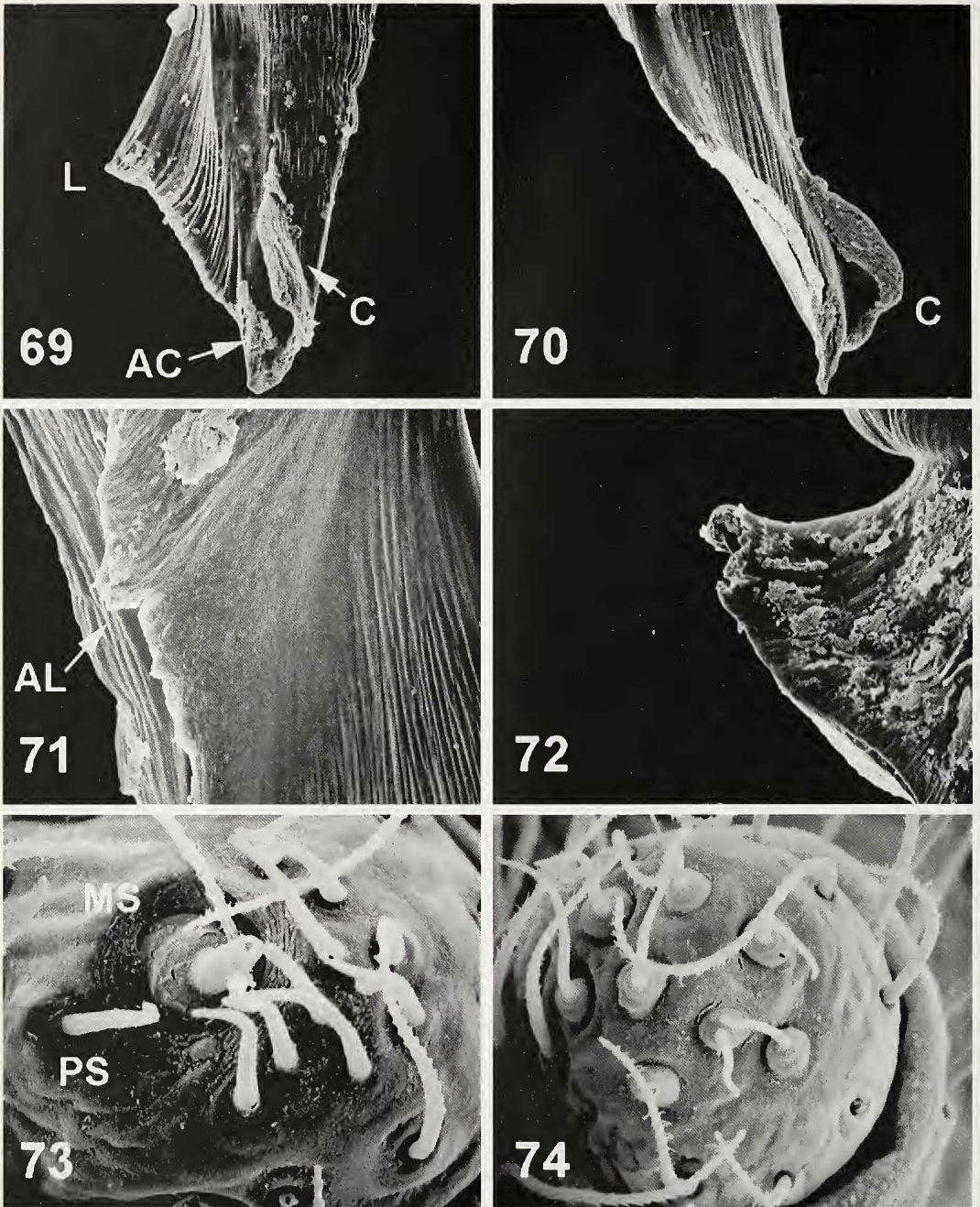
**Distribution.**—Tenerifean endemic. Known from a single locality on the island's northern slope.

*Dysdera esquiveli* Ribera & Blasco 1986  
Figs. 75–86, Table 6

*Dysdera esquiveli* Ribera & Blasco 1986: 42–44, fig. 1A–F [♂, ♀]. Holotype male and paratype female from Cueva del Viento-Sobrado, Icod de los Vinos, Tenerife, Canary Islands; 23 March 1983, J.L. Martín leg.; ♂ num. T-CV-118, num. T-CV-119; Stored at UL. Examined. -Wunderlich 1991: 284–287.

**Diagnosis.**—*Dysdera esquiveli* can be distinguished from all other *Dysdera* species, except *D. hernandezi* new species and *D. gollumi*, by its small size (carapace < 2.5 mm) and complete eye reduction. It differs from *D. gollumi* (male unknown) by its smooth carapace. It differs from the very similar *D. hernandezi* new species (male unknown) by presence of cheliceral granulation, fang shape, and distinct spination pattern (Table 6).

**Description.**—*Holotype male*: Figs. 75–77, 81–84. Carapace (Fig. 75) 1.96 mm long; maximum width 1.46 mm; minimum width 0.88 mm. Brownish-orange, uniformly distrib-



Figures 69–74.—69–72, *Dysdera curvisetae*, right male bulb. 69, DD frontal; 70, DD external; 71, DD posterior; 72, P external. 73–74. *Dysdera chioensis*, spinnerets. 73, Right ALS; 74, Right PLS.

uted; slightly foveate at borders, wrinkled at middle, covered with tiny granulations. Frontal border roughly round, markedly smaller than  $\frac{1}{2}$  carapace length; anterior lateral borders slightly divergent, or parallel; rounded at maximum dorsal width point, back lateral bor-

ders straight; back margin narrow, straight. Eyeless. Labium trapezoid-shaped, base wider than distal part; as long as wide at base (triangle-like); semicircular groove at tip. Sternum orange, uniformly distributed; wrinkled; covered in hairs mainly on margin.

Table 6.—Intraspecific spination variability of *Dysdera esquivei*.

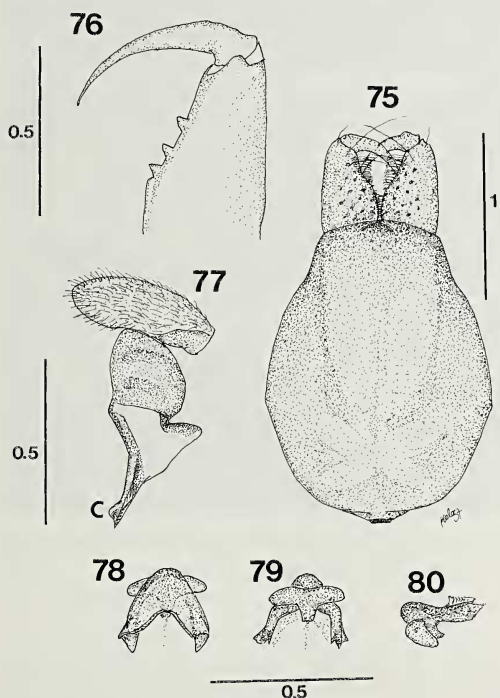
	Proximal	Medial-proximal	Medial-distal	Distal
Tibia 3 dorsal	1.0.0-1	0-1.0-1.0	0	1.0.0-1
Tibia 4 dorsal	0-1.0.0	0-1.0-1.0-1	0	1.0.0-1
Tibia 3 ventral	0-1.0-1.0-1	0	0	0-1.0-1.0
Tibia 4 ventral	0-2.0-1.0	1.1.1	0-1.0-1.0-1	0-1.0.0-1
	Number of rows		Number of spines	
Femur 3 dorsal	1		0-1	
Femur 4 dorsal	2		0-1/1-3	
			Number of spines	
Patella 3 ventral			0-1	
Patella 4 ventral			1-3	

Chelicerae (Fig. 76) 0.67 mm long, about  $\frac{1}{4}$  of carapace length in dorsal view; fang medium-sized, 0.51 mm; basal segment dorsal side completely covered with piligerous granulations (distally scarce), ventral side smooth. Chelicera inner groove medium-size, about  $\frac{2}{5}$  cheliceral length; armed with three teeth and lamina at base; D = M = B; D triangular, located roughly at center of groove; B close

to basal lamina; M close to B. Legs pale yellow. Lengths of male described above: fe1 1.67 mm (all measurements in mm); pa1 1.06; ti1 1.39; me1 1.34; ta1 0.46; total 5.92; fe2 1.52; pa2 0.89; ti2 1.32; me2 1.24; ta2 0.4; total 5.37; fe3 1.11; pa3 0.61; ti3 0.76; me3 1.01; ta3 0.28; total 3.77; fe4 1.52; pa4 0.78; ti4 1.14; me4 1.34; ta4 0.4; total 5.18; relative length: 1 > 2 > 4 > 3; palp: fe 0.86; pa 0.43; ti 0.43; ta 0.51; total 2.23. Spination: palp, leg1, leg2 spineless. Fe3 dorsal spineless; pa3 1-0 ventral; ti3 dorsal spines arranged in two bands: proximal 1.0.0; distal 1.0.0; ti3 ventral spines arranged in two bands: proximal 0.1-0.0; distal 1.0.0; with two terminal spines. Fe4 dorsal spines in one row: 1; pa4 2-3 ventral; ti4 dorsal spines arranged in two bands: medial-proximal 1.0.1; distal 1.0.1; ti4 ventral spines arranged in four bands: proximal 1.0.0; medial-proximal 1.1.1; medial-distal 1.0-1.1; distal 1.0.1; without terminal spines. Dorsal side of frontal legs smooth; ventral side of palp smooth; long, spine-like hairs on ventral posterior ti, fe. Claws with 10-14 teeth, length twice claw width.

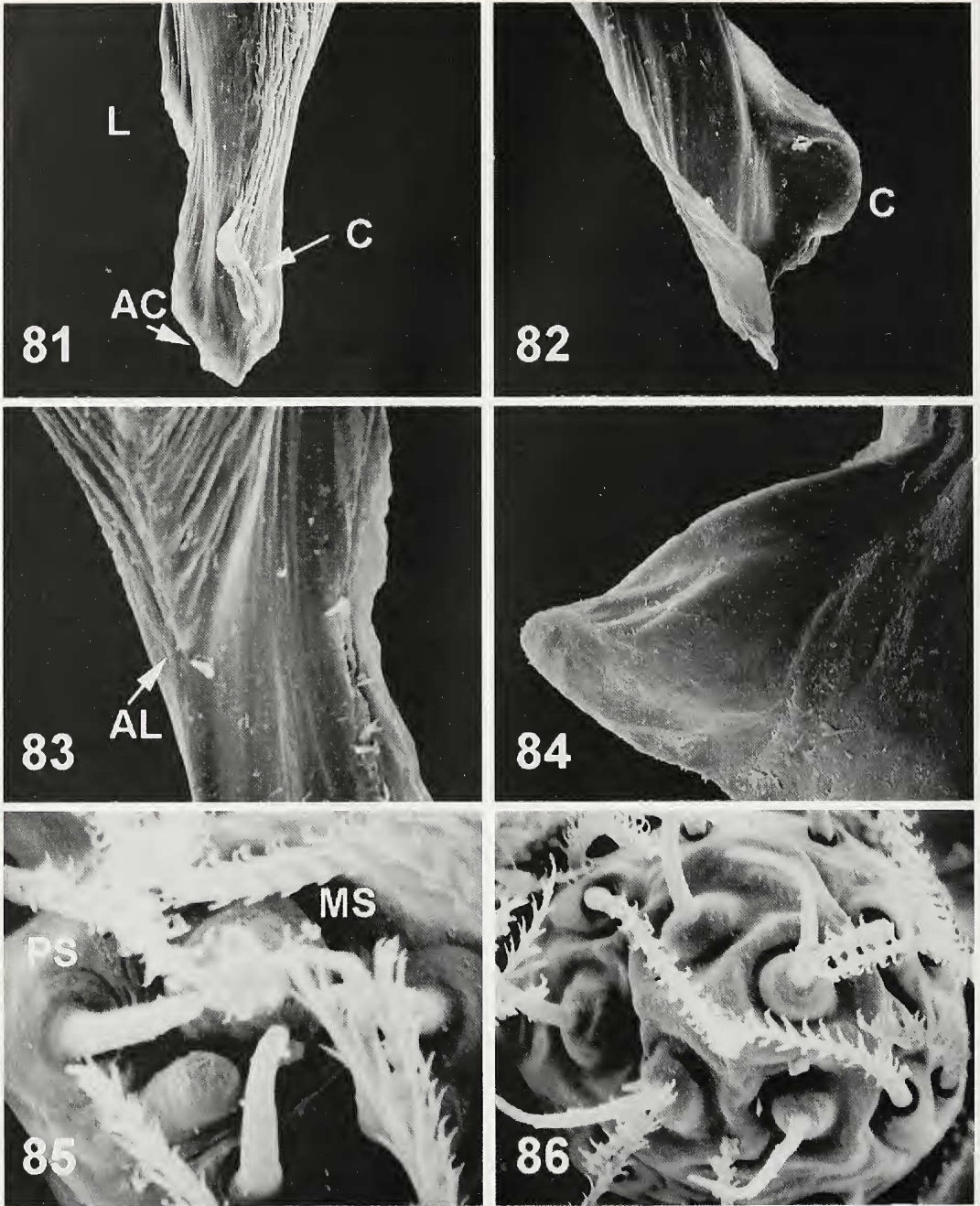
Abdomen 2.28 mm long; whitish; cylindrical. Abdominal dorsal hairs 0.027 mm long; medium thickness, roughly straight, not compressed, blunt, tip enlarged; uniformly, scanty distributed.

Male bulb (Fig. 77): T slightly smaller than DD; external distal border straight; internal sloped backwards. DD slightly bent in lateral view, clearly less than 45°; internal distal border not expanded. IS and ES equally developed; IS truncated at DD middle part. DD tip straight in lateral view. C present, short; distal



Figures 75-80.—*Dysdera esquivei*. 75, Carapace, dorsal; 76, Left chelicera, ventral; 77, Left male bulb, external; 78, Vulva, dorsal; 79, Vulva, ventral; 80, Vulva, lateral. Scale bars in mm.





Figures 81–86.—*Dysdera esquiveli*, right male bulb and female spinnerets. 81, DD frontal; 82, DD external; 83, DD posterior; 84, P external; 85, Right ALS; 86, Right PLS.

end on DD internal tip; well-developed; located close to DD distal tip (Figs. 81–83); proximal border sharply decreasing; distal border stepped, upper tip not projected, rounded; external side hollowed. AC present. LF absent. L poorly developed; external border

not sclerotized, laterally slightly folded; distal border approximately parallel, not continuous, upper sheet slightly folded at middle (?). AL present, very poorly developed; proximal border in posterior view fused with DH. P (Fig. 84) fused to T; perpendicular to T in lateral

Table 7.—Intraspecific spination variability of *Dysdera gibbifera*.

	Proximal	Medial-proximal	Medial-distal	Distal
Tibia 3 dorsal	1.1-2.1	0-1.0.0	0	1.0.0-1
Tibia 4 dorsal	0.0.1	1.0-1.1	1.0-1.0	1.0.1
Tibia 3 ventral	0-1.0.0	1.1.0-1	0	1.0-1.0
Tibia 4 ventral	1.1-2.1	1.0-1.0-1	0.1.0	1.0.1
	Number of rows		Number of spines	
Femur 3 dorsal	0		0	
Femur 4 dorsal	1		0-2	

view; lateral length from  $\frac{2}{3}$  to as long as T width; ridge present, perpendicular to T, not expanded; upper margin smooth; distally slightly projected; back margin slightly folded towards internal side.

*Paratype female:* Figs. 78–80, 85, 86. All characters as in male except: Carapace 2.14 mm long; maximum width 1.58 mm; minimum width 0.98 mm.

Chelicerae 0.84 mm long; fang 0.6 mm.  $B > D = M$  (slightly). Leg lengths of female described above: fe1 1.77 mm (all measurements in mm); pa1 1.19; ti1 1.39; me1 1.26; ta1 0.38; total 5.99; fe2 1.52; pa2 1.09; ti2 1.24; me2 1.14; ta2 0.38; total 5.37; fe3 1.19; pa3 0.66; ti3 1.21; me3 1.14; ta3 0.4; total 4.6; fe4 1.57; pa4 0.86; ti4 1.26; me4 1.52; ta4 0.4; total 5.61; relative length:  $1 > 4 > 2 > 3$ ; palp: fe 0.94; pa 0.38; ti 0.38; ta 0.51; total 2.21. Spination: palp, leg1, leg2 spineless. Fe3 dorsal spineless; pa3 1-0 ventral; ti3 dorsal spines arranged in two bands: proximal 1-0.0.0; distal 1.0.0; ti3 ventral spines arranged in one band: distal 1.0.0; with two terminal spines. Fe4 dorsal spines in one row: 1; pa4 2-1 ventral; ti4 dorsal spines arranged in two bands: medial-proximal 1.0.1; distal 1.0.1; ti4 ventral spines arranged in four bands: proximal 1.0.0; medial-proximal 1.1.1; medial-distal 1.0.1; distal 1.0.1; without terminal spines.

Abdomen 2.7 mm long; whitish; cylindrical. Abdominal dorsal hairs 0.05 mm long; medium thickness, curved, compressed (?), blunt, tip not enlarged; uniformly, scantily distributed. Vulva (Figs. 78–80) arch-like in dorsal view, frontally pointed; slightly wider than long; DF wide. MF poorly developed. VA frontal region completely sclerotized; posterior region sclerotized at anterior area. AVD hardly visible. S attachment not projected under VA; arms as long as DA, slightly curved;

tips not projected; neck as wide as arms. TB usual shape. ALS (Figs. 85, 86) with PS; remaining piriform spigots more external than MS, arranged in one row; 3 + 1 piriform gland spigots; PMS, PLS with fewer than 5 aciniform gland spigots.

**Intraspecific variation.**—Male cephalothorax ranges in length from 1.96–2.28 mm. Labrada specimen, carapace back margin slightly bilobulated. AME, PLE present, reduced to tiny whitish spots. Sternum lacking ornamentation. Chelicera dorsal relative size from  $\frac{1}{4}$ – $\frac{2}{5}$  of carapace length. B larger than or

equal to D, larger than or equal to M. In general, cheliceral teeth are small. M closer to B. P very slightly toothed at distal tip (1 or 2 teeth). Spination variability in Table 6.

**Additional material examined.**—**TENERIFE:** *El Sauzal:* Cueva Labrada, 11 December 1984, 1♂ (J.J. Hernández, num. 2529 UL). *Icod de los Vinos:* Cueva Felipe Reventón, 3 March 1984, 1♂ paratype (G.I.E.T, num. 2526 UL); 20 June 1994, 1♂ (P. Oromí, num. 2801 UL); 22 April 1993, 1♀ (P. Oromí, num. 2548 UL); 18 May 1985, 1♂ (Hernández, Izquierdo & Medina, num. 2716 UL); ? May 1994, 1♂ (M. Arechavaleta, num. 2800 UL); ? May 1994, 1♀ (M. Arechavaleta, num. 2803 UL). Cueva del Viento-Sobrado, 23 March 1983, 1♂, Ijuv. paratype (J.L. Martín, num. 2528 UL); 2 December 1992, 1♂ (I. Izquierdo, num. 2549 UL); ? May 1994, 1♂ (Piquetas, num. 2804 UL).

**Distribution.**—Tenerife endemic. Known from several lava tubes on the northern slope.

*Dysdera gibbifera* Wunderlich 1991

Figs. 87–95, Table 7

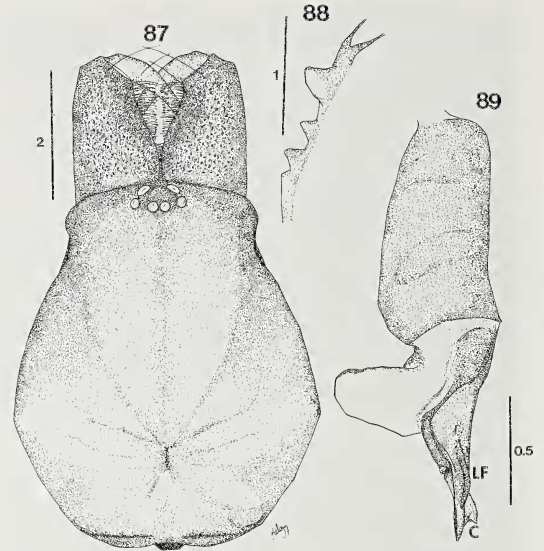
*Dysdera gibbifera* Wunderlich 1991: 293–294, fig. 35, 36, 38, 39 [♂] (♂; non♀, incorrect identification). Holotype male from MSS-3 Monte del Agua, Los Silos, Tenerife, Canary Islands; 10 July 1988, A.L. Medina leg.; num.T-H3-124;

Stored at UL. Examined. -Wunderlich 1991:284-287. -Arnedo & Ribera 1997.

**Diagnosis.**—*Dysdera gibbifera* can be distinguished from most of remaining Canarian *Dysdera* species by its large size (carapace 6.00 mm long). It differs from other large species such as *D. ambulotenta*, *D. hirguan* Arnedo, Oromi & Ribera 1996, *D. insulana*, *D. labradaensis* and *D. longa* Wunderlich 1991, by its poorly spinated legs (Table 7).

**Description.**—*Holotype male*: Figs. 87–92. Carapace (Fig. 87) 5.81 mm long; maximum width 4.97 mm; minimum width 3.22 mm. Dark brownish-red, frontally darker, becoming lighter towards back; smooth with some black fine-textured granular material mainly at front. Frontal border roughly triangular, from  $\frac{1}{2}$ – $\frac{2}{3}$  carapace length; anterior lateral borders slightly convergent; sharpened at maximum dorsal width point, back lateral borders straight; back margin wide, straight. AME diameter 0.23 mm; PLE 0.21 mm; PME 0.2 mm; AME slightly back from frontal border, separated one from another about  $\frac{1}{2}$  of diameter, far from PLE; PME about  $\frac{1}{4}$  of diameter apart, about  $\frac{2}{3}$  PME diameter from PLE. Labium trapezoid-shaped, base wider than distal part; semicircular groove at tip. Sternum brownish-red, frontally darker, becoming lighter towards back; slightly wrinkled; covered in hairs mainly on margin.

Chelicerae (Fig. 88) 2.94 mm long, about  $\frac{2}{3}$  of carapace length in dorsal view; fang medium-sized, 2.1 mm; basal segment dorsal, ventral side completely covered with piligerous granulations (small, dense). Chelicera inner groove short, about  $\frac{1}{3}$  cheliceral length; armed with three teeth and lamina at base;  $D > B = M$  (large); D trapezoid, located near segment tip; B close to basal lamina; M close to B. Legs dark orange-colored. Lengths of male described above: fe1 5.6 mm (all measurements in mm); pa1 3.99; ti1 5.32; me1 4.9; ta1 0.91; total 19.81; fe2 5.11; pa2 3.57; ti2 4.83; me2 4.76; ta2 0.91; total 19.18; fe3 4.41; pa3 2.59; ti3 3.5; me3 4.41; ta3 0.91; total 15.82; fe4 5.67; pa4 3.01; ti4 4.62; me4 6.02; ta4 1.12; total 20.44; relative length:  $4 > 1 > 2 > 3$ ; palp: fe 3.5; pa 1.68; ti 1.75; ta 1.47; total 8.4. Spination: palp, leg1, leg2 spineless. Fe3 dorsal spineless; ti3 dorsal spines arranged in two bands; proximal 1.1.1;

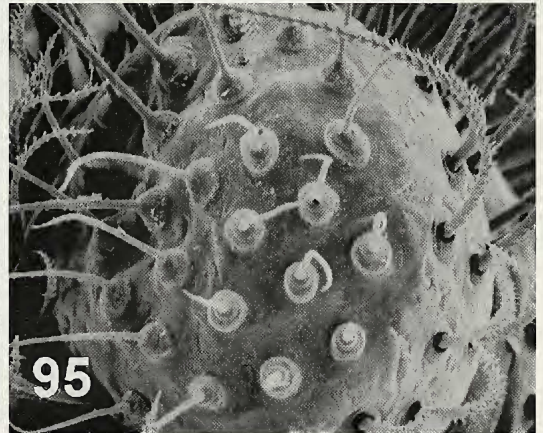
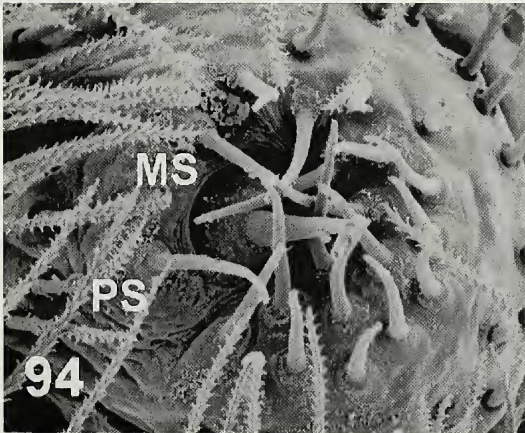
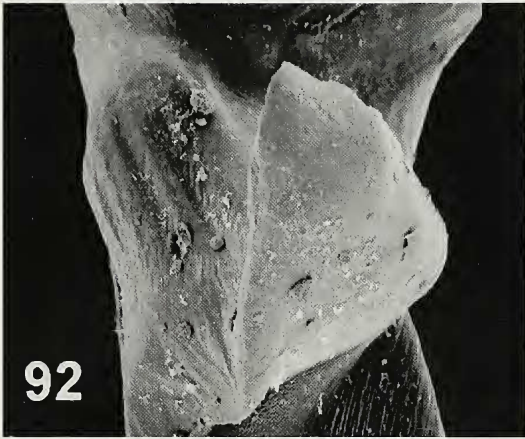
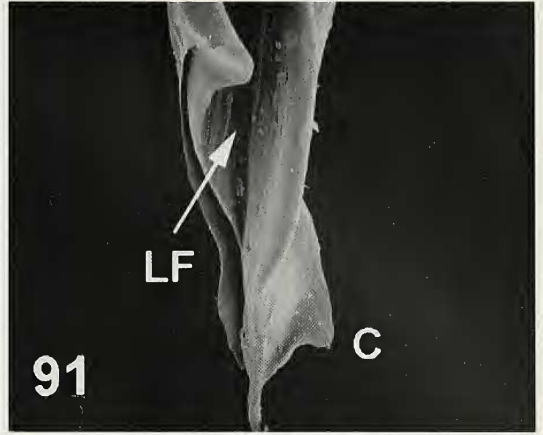
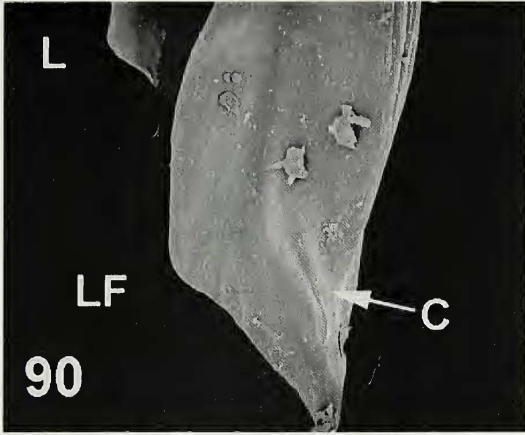


Figures 87–89.—*Dysdera gibbifera*. 87, Carapace, dorsal; 88, Left chelicera, ventral; 89, Right male bulb, external. Scale bars in mm.

distal 1.0.0; ti3 ventral spines arranged in three bands: proximal 1-0.0.0; medial-proximal 1.1.0; distal 1.0.0; with two terminal spines. Fe4 dorsal spines in one row: 0-1; ti4 dorsal spines arranged in four bands: proximal 0.0.1; medial-proximal 1.1.1; medial-distal 1.0.0; distal 1.0.1; ti4 ventral spines arranged in three bands: proximal 1.1.1; medial-proximal 1.1-0.0; distal 1.0-1.1; with two terminal spines. Dorsal side of frontal legs, ventral side of palp with a fine-textured, piligerous, granular surface. Claws with more than 20 teeth, slender, length twice claw width.

Abdomen 6.3 mm long; whitish; cylindrical. Abdominal dorsal hairs 0.009–0.027 mm long (very small); medium thickness, roughly straight, not compressed, blunt, tip enlarged; uniformly, scantily distributed. ALS (Figs. 94, 95) with PS; remaining piriform spigots no more external than MS, arranged in three rows; 18 + 1 piriform gland spigots; PMS, PLS with more than 20 aciniform gland spigots.

Male bulb: (Fig. 89). T slightly longer than DD, or T as long as DD; external, internal distal border sloped backwards. DD not bent, same T axis in lateral view; internal distal border not expanded. ES wider, more sclerotized than IS; IS continuous to tip. DD tip (Figs. 90–92) straight in lateral view. C present, short; distal end on DD internal tip; well-de-



Figures 90–95.—*Dysdera gibbifera*, right male bulb and spinnerets. 90, DD frontal; 91, DD external; 92, DD posterior; 93, P external; 94, Right ALS; 95, Right PLS.

veloped; located far from DD distal tip; proximal border sharply decreasing; distal border sloping on its base, upper tip not projected, pointed; external side hollowed (slightly). AC absent. LF present; distally not projected; well-developed. L well-developed; external

border sclerotized, laterally markedly folded backwards; distal border divergent, continuous. AL absent. P (Fig. 93) fused to T; markedly sloped on its proximal part, perpendicular on distal; lateral length as long as or longer than T width; ridge present, not sclerotized,

perpendicular to T, distinctly expanded, rounded; upper margin smooth; not distally projected; back margin not folded.

*Female*: Unknown.

**Intraspecific variation.**—Male cephalothorax ranges in length from 5.81–7.00 mm. Carapace very slightly wrinkled. AME separation from  $\frac{1}{2}$ – $\frac{2}{3}$  of diameter. Sternum hardly wrinkled. P distally slightly toothed. Spination variability in Table 7.

**Additional material examined.**—**TENERIFE:** *Icod de los Vinos*: Cueva de Felipe Reventón; 17 February 1985, 1♂ (J.J. Hernández & A.L. Medina, num. 2709 UL). *Los Silos*: Monte del Agua, 6 July 1990, 1♂ (C.G. Campos, num. 2779 UL).

**Distribution.**—Tenerifean endemic. Known from two localities at westernmost part of the northern slope, including Teno.

**Comments.**—The study of the female specimens assigned to this species in the original description (Wunderlich 1991) shows that they actually belonged to a different species, the already identified Tenerifean species *D. insulana* (Arnedo & Ribera 1997). Therefore, the female of this species is currently unknown.

*Dysdera gollumi* Ribera & Arnedo 1994  
Figs. 118–119

*Dysdera gollumi* Ribera & Arnedo 1994: 115–119, fig. 1–3 [♀]. Holotype female from Cueva de Los Roques, La Orotava, Tenerife, Canary Islands; 27 October 1991, C. Ribera leg.; num. 2567; Stored at UB. Examined.

**Diagnosis.**—*Dysdera gollumi* can be distinguished from most of the Canarian *Dysdera* species by the eye reduction, spineless legs and small size (carapace  $\leq$  2.00 mm long). It differs from the other small and troglomorphic species, *D. esquiveli* and *D. hernandezi* new species, by its markedly foveate carapace.

**Description.**—*Holotype female*: Carapace 2.05 mm long; maximum width 1.49 mm; minimum width 0.79 mm. Dark reddish-brown, darkened at borders; heavily wrinkled, foveate, covered with small black 'granules'. Frontal border roughly triangular, markedly smaller than  $\frac{1}{2}$  carapace length; anterior lateral borders divergent; rounded at maximum dorsal width point, back lateral borders rounded; back margin projected. PME, PLE lost; AME markedly reduced (tiny bright spots); AME diameter 0.022 mm; AME separation

0.12 mm. Labium trapezoid-shaped, base wider than distal part; as long as wide at base (triangle-like); semicircular groove at tip. Sternum orange-brown, darkened on borders; heavily wrinkled; covered in hairs mainly on margin.

Chelicerae 0.63 mm long, about  $\frac{1}{4}$  of carapace length in dorsal view; fang short, 0.44 mm; basal segment proximal dorsal side scantily covered with large piligerous granulations. Chelicera inner groove medium-size, about  $\frac{2}{3}$  cheliceral length; armed with three teeth and lamina at base;  $D = B > M$  (very slightly); D triangular, located roughly at center of groove; B close to basal lamina; M at middle of B and D. Legs bicolored, darker on proximal border, becoming lighter distally. Lengths of female described above: fe1 2.1 mm (all measurements in mm); pa1 1.03; ti1 1.96; me1 2; ta1 0.51; total 7.6; fe2 1.72; pa2 1.03; ti2 1.68; me2 1.77; ta2 0.51; total 6.71; fe3 1.44; pa3 0.7; ti3 1.12; me3 1.49; ta3 0.42; total 5.17; fe4 1.91; pa4 0.98; ti4 1.58; me4 2.05; ta4 0.56; total 7.08; relative length  $1 > 4 > 2 > 3$ ; palp: fe 0.76; pa 0.36; ti 0.41; ta 0.61; total 2.14. Spination: spineless. Dorsal side of frontal legs smooth; ventral side of palp covered with hairs, lacking a granular surface. Claws with 8 teeth or less, robust, hardly larger than claw width.

Abdomen 3.26 mm long; whitish; globular. Abdominal dorsal hairs 0.054 mm long; thin, curved, not compressed, blunt, tip not enlarged; uniformly, scantily distributed. Vulva arch-like in dorsal view, frontally rounded; slightly wider than long; DF wide. MF poorly developed. VA frontal region completely sclerotized; posterior region sclerotized at anterior area. AVD hardly visible. S attachment projected under VA; arms slightly shorter than DA, slightly curved; tips not projected; neck as wide as arms. TB usual shape. ALS (Figs. 118, 119) with PS; remaining piriform spigots more external than MS, arranged in one row; 5 + 1 piriform gland spigots; PMS, PLS with fewer than 5 aciniform gland spigots.

*Male*: Unknown.

**Intraspecific variation.**—Female cephalothorax ranges in length from 1.82–2.05 mm. Cheliceral teeth small,  $B > M > D$ . Chelicera groove short. Vulva frontally pointed, in dorsal view. As wide as long.

**Additional material examined.**—**TENERIFE:**

Table 8.—Intraspecific spination variability of *Dysdera guayota*.

	Proximal	Medial-proximal	Medial-distal	Distal
Tibia 3 dorsal	1.1-2.1	0	0	1.0.1
Tibia 4 dorsal	0.0.0-1	1.1.1	0	1.0.1
Tibia 3 ventral	1.1-2.0	0	0	1.0-1.0
Tibia 4 ventral	1.1.1	0-1.1.0	0	0-1.0.0-1
	Number of rows		Number of spines	
Femur 1 dorsal	1		1-2	
Femur 2 dorsal	1		2-3	
Femur 3 dorsal	2		1-10/0-9	
Femur 4 dorsal	2		1-4/4-7	

*La Orotava*: Cueva de Los Roques, 28 December 1982, 1 juv. (J.L. Martín, num. 2537 UL); ? November 1995, 1 ♀ (P. Oromí, num. 2966 UB).

**Distribution.**—Tenerifean endemic. Known from a single lava tube, located at dry, middle-southern slope.

**Comments.**—Drawings of carapace, chelicera and vulva of this species have been published elsewhere (Ribera & Arnedo 1994). In the present article, SEM photographs of spinnerets are provided for the first time.

*Dysdera guayota* new species

Figs. 96–107, Table 8

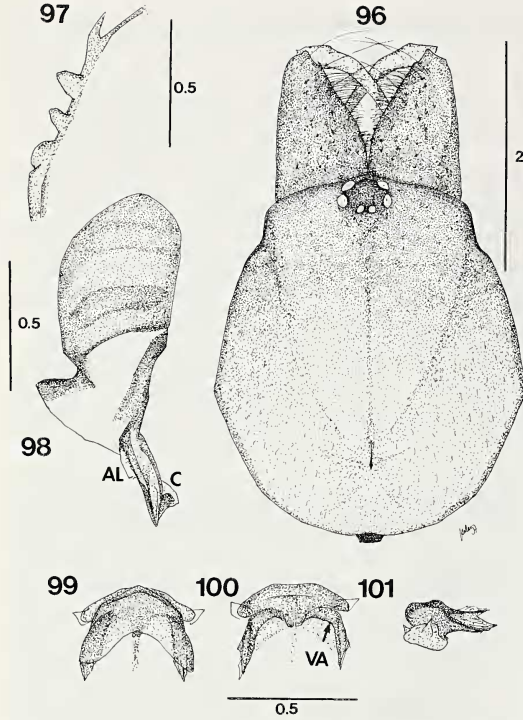
**Types.**—Holotype male from Las Cañadas, La Orotava, Tenerife, Canary Islands; 22 October 1995, A. Camacho leg.; num. 3153. Stored at UB. Paratype female from Las Cañadas del Teide, close to crossroads to Vilaflor, Adeje, Tenerife, Canary Islands; 29 November 1993, Arnedo & Fluhr leg.; num. 4826. Stored at UB.

**Etymology.**—The name in apposition of this species means ‘devil’ in the language of the ‘guanches,’ the ancient aboriginal inhabitants of Tenerife.

**Diagnosis.**—*Dysdera guayota* new species can be distinguished from all other Canarian *Dysdera* species except *D. chioensis*, *D. labradaensis* and *D. lancerotensis* by having spines on anterior femora (legs 1, 2). Males differs from *D. lancerotensis* by lacking hook-like apophysis in frontal-distal tip of bulb distal division (DD) and bulb posterior apophysis (P) fused to tegulum (T), and females by the sclerotization of frontal part of vulva ventral (VA). It differs from *D. labradaensis* and *D. chioensis* by not showing eye reduction.

**Description.**—*Holotype male*: Figs. 96–98, 102–105. Carapace (Fig. 96) 3.63 mm long; maximum width 3.17 mm; minimum width 2.1 mm. Brownish-orange, frontally darker, becoming lighter towards back; smooth with some small black ‘granules’ mainly at front; hairy, covered with black hairs mainly at lateral and back borders. Frontal border roughly straight, from  $\frac{1}{2}$ – $\frac{3}{5}$  carapace length; anterior lateral borders slightly convergent; sharpened at maximum dorsal width point, back lateral borders straight; back margin wide, straight. AME diameter 0.16 mm; PLE 0.12 mm; PME 0.11 mm; AME slightly back from frontal border, separated one from another about 1 diameter or more, close to PLE; PME about  $\frac{1}{4}$  of diameter apart, about  $\frac{1}{5}$  PME diameter from PLE. Labium trapezoid-shaped, base wider than distal part; longer than wide at base (rectangle-like); semicircular groove at tip. Sternum orange, uniformly distributed; very slightly wrinkled, mainly between legs, frontal border; uniformly covered in slender black hairs.

Chelicerae (Fig. 97) 1.72 mm long, about  $\frac{1}{3}$  of carapace length in dorsal view; fang medium-sized, 1.12 mm; basal segment dorsal side completely covered with piligerous granulations, ventral side smooth. Chelicera inner groove short, about  $\frac{1}{3}$  cheliceral length; armed with three teeth and lamina at base;  $D > B > M$  (all large, B broken?); D trapezoid, located near segment tip; B close to basal lamina; M close to B. Front legs dark orange, back legs yellow. Lengths of male described above: fe1 2.98 mm (all measurements in mm); pa1 1.82; ti1 2.61; me1 2.61; ta1 0.6; total 10.62; fe2 2.65; pa2 1.68; ti2 2.56; me2 2.23; ta2 0.6;



Figures 96–101.—*Dysdera guayota* new species. 96, Carapace, dorsal; 97, Left chelicera, ventral; 98, Right male bulb, external; 99, Vulva, dorsal; 100, Vulva, ventral; 101, Vulva, lateral. Scale bars in mm.

total 9.72; fe3 2.1; pa3 1.21; ti3 1.68; me3 2.05; ta3 0.56; total 7.6; fe4 2.7; pa4 1.44; ti4 2.14; me4 2.56; ta4 0.65; total 9.49; relative length:  $1 > 2 > 4 > 3$ ; palp: fe 1.79; pa 0.88; ti 0.7; ta 0.93; total 4.3. Spination: palp spineless. Fe1 3-2 distal, anterior margin. Fe2 2-3 distal, anterior margin. Fe3 dorsal spines in two rows: anterior 9-10; posterior 5-4; ti3 dorsal spines arranged in two bands: proximal 1.1.1; distal 1.0.1; ti3 ventral spines arranged in two bands: proximal 1.1.0; distal 1.0.0; with one terminal spine on anterior margin. Fe4 dorsal spines in two rows: anterior 4-2; posterior 7-5; ti4 dorsal spines arranged in three bands: proximal 0.0.1; medial-proximal 1.1.1; distal 1.0.1; ti4 ventral spines arranged in three bands: proximal 1.1.1; medial-proximal 0.1.0; distal 1.0.1; with two terminal spines. Dorsal side of frontal legs, ventral side of palp covered with hairs. Claws with 8 teeth or less; robust, hardly larger than claw width.

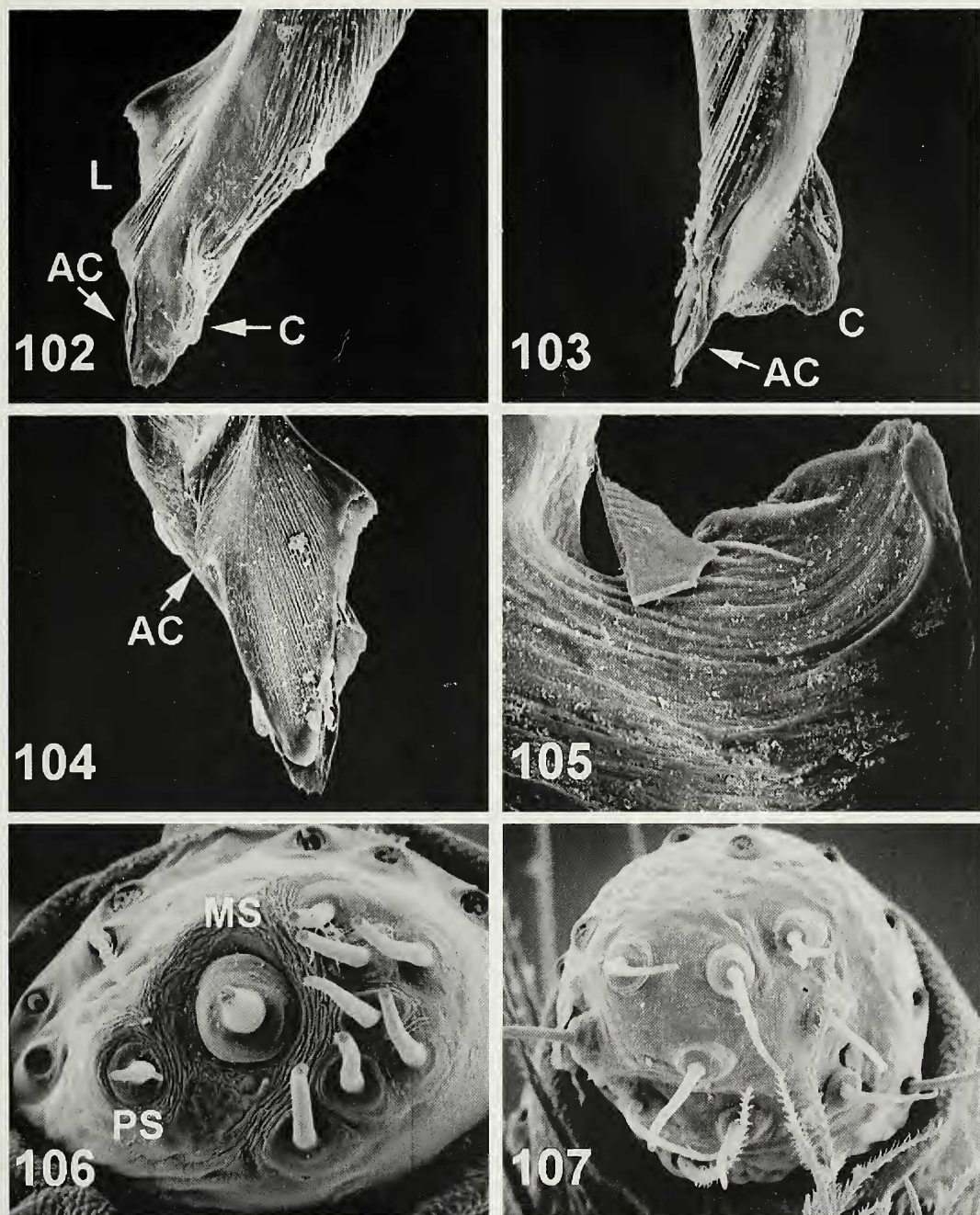
Abdomen 3.59 mm long; whitish; cylindrical. Abdominal dorsal hairs 0.09 mm long;

thick, slightly curved, compressed, blunt, tip not enlarged; uniformly, thickly distributed.

Male bulb (Fig. 98): T as long as DD; external, internal distal border sloped backwards. DD proximally bent about  $45^\circ$  in lateral view; internal distal border not expanded. IS and ES equally developed; IS truncated at DD middle part. DD tip (Figs. 102–104) sloped towards back in lateral view. C present, short; distal end on DD internal tip; well-developed; located close to DD distal tip; proximal border sharply decreasing; distal border stepped, upper tip projected, pointed; external side hollowed. AC present. LF absent. L well-developed; external border not sclerotized, laterally slightly folded; distal border divergent, not continuous; upper sheet strongly fold at middle. AL present, well-developed; proximal border in posterior view toothed on its internal half-part. P (Fig. 105) fused to T; perpendicular to T in lateral view; lateral length from  $\frac{1}{2}$ – $\frac{2}{3}$  of T width; ridge present, perpendicular to T, not expanded; upper margin markedly toothed, along its extent, few teeth; not distally projected; back margin not folded.

*Paratype female*: Figs. 99–101, 106, 107. All characters as in male except: Carapace 3.36 mm long; maximum width 2.75 mm; minimum width 1.86 mm. Orange. AME diameter 0.18 mm; PLE 0.12 mm; PME 0.12 mm; PME  $\frac{3}{5}$  diameter from PLE. Sternum yellow, frontally darker, becoming lighter towards back; smooth.

Chelicerae 1.75 mm long; fang 0.31 mm; basal segment proximal dorsal side scantily covered with piligerous granulations.  $B > D > M$  (B, D similar). Legs yellow. Lengths of female described above: fe1 2.33 mm (all measurements in mm); pa1 1.49; ti1 1.86; me1 1.4; ta1 0.46; total 7.54; fe2 2.14; pa2 1.4; ti2 1.86; me2 1.58; ta2 0.46; total 7.44; fe3 1.72; pa3 1.02; ti3 1.35; me3 1.58; ta3 0.46; total 6.13; fe4 2.37; pa4 1.26; ti4 1.86; me4 2.1; ta4 0.56; total 8.15; relative length  $4 > 1 > 2 > 3$ ; palp: fe 1.49; pa 0.64; ti 0.51; ta 0.74; total 3.38. Spination: palp spineless. Fe1: 2 distal, anterior margin. Fe2: 2-1 distal, anterior margin. Fe3 dorsal spines in one row: 1 (medial frontal); ti3 dorsal spines arranged in two bands: proximal 1.1.1; distal 1.0.1; ti3 ventral spines arranged in two bands: proximal 1.1.0; distal 1.0.0; with two terminal spines. Fe4 dorsal spines in two rows: anterior 1; posterior 4; ti4 dorsal spines arranged in



Figures 102–107.—*Dysdera guayota* new species, right male bulb and female spinnerets. 102, DD frontal; 103, DD external; 104, DD posterior; 105, P internal; 106, Right ALS; 107, Right PLS.

two bands: medial-proximal 1.1.1; distal 1.0.1; ti4 ventral spines arranged in three bands: proximal 1.1.1; medial-proximal 0.1.0; distal 1-0.0.0-1; with two terminal spines. Dorsal side of frontal legs smooth.

Abdomen 3.59 mm long; whitish; cylindri-

cal. Abdominal dorsal hairs 0.162 mm long; medium thickness, curved, compressed, pointed; uniformly, thickly distributed. Vulva (Figs. 99–101) arch-like in dorsal view, frontally rounded; slightly wider than long; DF wide. MF poorly developed. VA frontal re-



Table 9.—Intraspecific spination variability of *Dysdera hernandezi*.

	Proximal	Medial-proximal	Medial-distal	Distal
Tibia 3 dorsal	0	0	0	1.0.0
Tibia 4 dorsal	0	0	0	0.0.1
Tibia 3 ventral	0	0	0	0
Tibia 4 ventral	1.0-1.0	0	0	1.0.0

gion completely sclerotized; posterior region sclerotized at anterior area. AVD hardly visible. S attachment projected under VA; arms as long as DA, slightly curved; tips dorsally projected; neck as wide as arms. TB usual shape. ALS (Figs. 106, 107) with PS; remaining piriform spigots more external than MS, arranged in two rows; 7 + 1 piriform gland spigots; PMS, PLS with 5–10 aciniform gland spigots.

**Intraspecific variation.**—Female cephalothorax ranges in length from 3.15–3.36 mm. PLE-PME from  $\frac{2}{3}$ –1 diameter. Spination variability in Table 8.

**Paratypes.**—**TENERIFE:** *Adeje:* Las Cañadas, close to crossroads to Vilaflor; 1juv.; November 1993, Arnedo & Fluhr leg.; num. 4815 (T10); Stored at UB. Roque del Conde; 1juv. paratype; 16 March 1996, P. Oromí leg.; num. 3170; Stored at UL. Arona: Los Cristianos; 1♀ paratype; 20 January 1996, Oromí leg.; num. 3094; Stored at UL.

**Distribution.**—Tenerifean endemic. Known from several localities on dry, south-western slope.

*Dysdera hernandezi* new species  
Figs. 108–112, 120, 121, Table 9

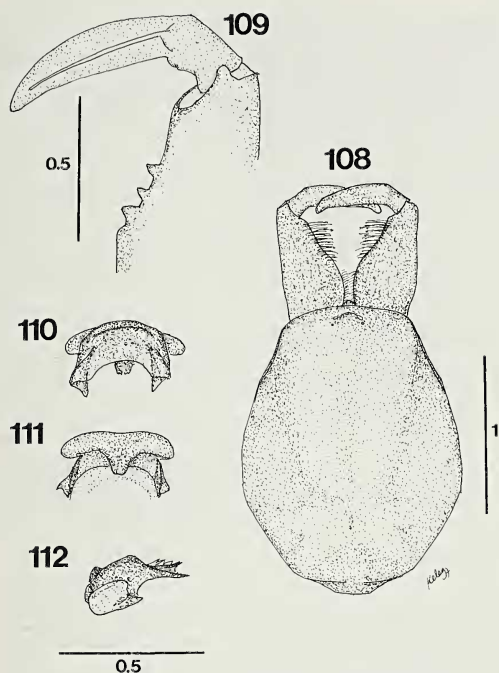
**Types.**—Holotype female from Cueva Labrada, El Sauzal, Tenerife; 11 December 1984, J.J. Hernández leg.; num. 3214; Stored at UL.

**Etymology.**—This species is dedicated to the late Juan José Hernández Pacheco, enthusiastic Canarian biospeleologist and collector of the only two known specimens of this species.

**Diagnosis.**—*Dysdera hernandezi* new species can be distinguished from most of the Canarian *Dysdera* by its flat and enlarged cheliceral fang (Fig. 109). A very similar fang shape is also present in *D. ramblae* Arnedo, Oromí & Ribera 1996 from La Gomera, from which differs by the smooth carapace, smaller size and eye reduction.

**Description.**—*Holotype female:* Figs. 108–112, 120, 121. Carapace (Fig. 108) 1.91 mm long; maximum width 1.4 mm; minimum width 0.9 mm. Pale orange, uniformly distributed; very slightly foveate at borders, wrinkled at middle, covered with tiny granulations. Frontal border roughly round, markedly smaller than  $\frac{1}{2}$  carapace length; anterior lateral borders divergent; rounded at maximum dorsal width point, back lateral borders straight; back margin projected. PME lost; AME, PLE markedly reduced (bright tiny spots); AME diameter 0.018 mm; PLE 0.018 mm; AME separation 0.16 mm; AME-PLE separation 0.018 mm. Labium trapezoid-shaped, base wider than distal part; as long as wide at base (triangle-like); semicircular groove at tip. Sternum pale orange, uniformly distributed; slightly wrinkled; covered in hairs mainly on margin.

Chelicerae (Fig. 109) 0.79 mm long, about  $\frac{1}{3}$  of carapace length in dorsal view; fang medium-sized, 0.65 mm; enlarged on middle part; basal segment smooth, with no granulations. Chelicera inner groove medium-size, about  $\frac{2}{5}$  cheliceral length; armed with three teeth and lamina at base; B > D > M (not very different, small); D triangular, located roughly at center of groove; B close to basal lamina; M close to B. Legs pale yellow. Lengths of female described above: fe1 1.42 mm (all measurements in mm); pa1 0.98; ti1 1.21; me1 1.21; ta1 0.37; total 5.2; fe2 1.35; pa2 0.93; ti2 1.16; me2 1.16; ta2 0.35; total 4.95; fe3 1.02; pa3 0.61; ti3 0.84; me3 0.98; ta3 0.32; total 3.77; fe4 1.35; pa4 0.74; ti4 1.12; me4 1.26; ta4 0.37; total 4.47; relative length 1 > 2 > 4 > 3; palp: fe 0.79; pa 0.42; ti 0.37; ta 0.51; total 2.09. Spination: palp, leg1, leg2 spineless. Fe3 dorsal spineless; ti3 dorsal spines arranged in one band: distal 1.0.0; ti3 ventral spines spineless; with one terminal spine on anterior margin. Fe4 dorsal



Figures 108–112.—*Dysdera hernandezei* new species. 108, Carapace, dorsal; 109, Left chelicera, ventral; 110, Vulva, dorsal; 111, Vulva, ventral; 112, Vulva, lateral. Scale bars in mm.

spineless; ti4 dorsal spines arranged in one band: distal 0.0.1; ti4 ventral spines arranged in two bands: proximal 1.1-0.0; distal 1.0.0; with two terminal spines. Dorsal side of frontal legs smooth; ventral side of palp covered with hairs, lacking a granular surface; long, spine-like hairs on posterior ti, fe (mainly ventral). Claws with 10–14 teeth, length twice claw width.

Abdomen 2.37 mm long; whitish; globular. Abdominal dorsal hairs 0.036 mm long; thin, curved, not compressed, blunt, tip not enlarged; uniformly, scantily distributed. Vulva (Figs. 110–112) DA arch-like in dorsal view, frontally rounded; slightly wider than long; DF wide. MF poorly developed. VA frontal region completely sclerotized; posterior region sclerotized at anterior area. AVD hardly visible. S attachment not projected under VA; arms as long as DA, straight; tips not projected; neck as wide as arms. TB usual shape. ALS (Figs. 120, 121) with PS; remaining piriform spigots more external than MS, arranged in one row; 4 + 1 piriform gland spigots; PMS, PLS with 5–10 aciniform gland spigots.

*Male:* Unknown.

**Intraspecific variation.**—Female cephalothorax ranges in length from 1.91–2.14 mm. Carapace frontal width about  $\frac{1}{2}$  of its length. Sternum wrinkled. Spination variability in Table 9.

**Paratype.**—**TENERIFE:** *El Sauzal:* Cueva Labrada; 1 ♀ paratype; 22 November 1984, J.J. Hernández leg.; num. 2585; Stored at UB.

**Distribution.**—Tenerifean endemic. Known from a single lava tube, located on middle-northern slope.

*Dysdera iguanensis* Wunderlich 1987

*Dysdera iguanensis* Wunderlich 1987: 57–58, Figs. 2–6 [♂]. -Wunderlich 1991: 294–295, fig. 41 [♀]. -Wunderlich 1991: 284–287. -Arnedo et al. 1996: 244, fig. 1F [♂]. -Arnedo & Ribera 1997.

**Distribution.**—Canarian endemic, known from Tenerife and a single location in Gran Canaria. In Tenerife it is an abundant species, spread through several localities on northern slope, including Anaga and Teno massifs.

**Comments.**—A complete redescription of this species has been published elsewhere (Arnedo & Ribera 1997).

*Dysdera insulana* Simon 1883

*Dysdera insulana* Simon 1883: 294–295, fig. 19 [♂] (♂, non ♀). -Simon 1907: 257–258, fig. A [♂]. -Strand 1911: 190. -Reimoser 1919. -Denis 1941: 108. -Denis 1953: 2. -Schmidt 1973: 360–361. -Wunderlich 1991: 67, 296. -Arnedo et al. 1996: 271–272. -Arnedo & Ribera 1997.

**Distribution.**—Canarian endemic, known from Tenerife and a single location in Gran Canaria. In Tenerife, known from several localities restricted to Anaga and closer location, formerly occupied by low-elevation laurel forest.

**Comments.**—A complete redescription of this species has been published elsewhere (Arnedo & Ribera 1997).

*Dysdera labradaensis* Wunderlich 1991  
Figs. 113–117, 122, 123, Table 10

*D. labradaensis* Wunderlich 1991: 296, figs. 47–49 [♀]. Holotype female from Cueva Labrada, El Sauzal, Tenerife, Canary Islands; 12 September 1984, G.I.E.T. leg.; num. T-CL-59; Stored at UL. Examined. -Wunderlich 1991: 284–287.

**Diagnosis.**—*Dysdera labradaensis* differs from similar and sympatric species *D. ambu-*

Table 10.—Intraspecific spination variability of *Dysdera labradaensis*.

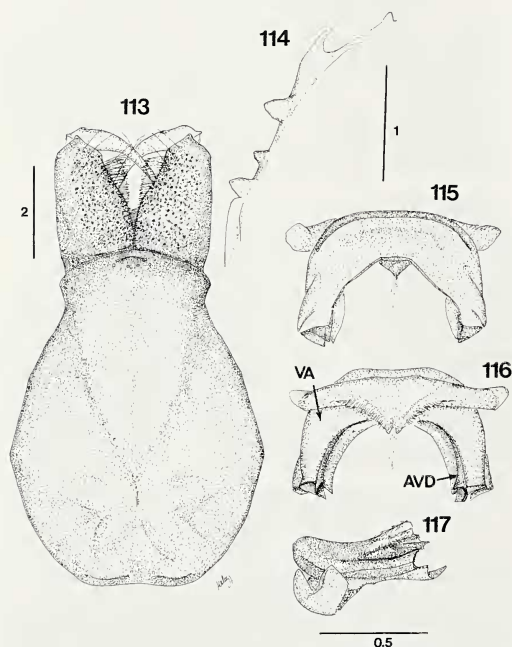
	Proximal	Medial-proximal	Medial-distal	Distal
Tibia 3 dorsal	0-1.0-1.0-1	0-1.0-2.0-1	1.0-1.0-1	1.0-1.1
Tibia 4 dorsal	1.2.1-2	1.1-3.1	1.0-1.1	1.1.1
Tibia 3 ventral	1.1.1	1.1.1	0	1.1.1
Tibia 4 ventral	0-1.0-2.1-2	1.1.1	1.1.1	1.1.1
Number of spines				
Patella 3 ventral			0-1	
Patella 4 ventral			0-1	
		Number of rows	Number of spines	
Femur 1 frontal		1	3	
Femur 2 frontal		1	1-2	
Femur 3 dorsal		2	3-4(distal)/2-3(proximal)	
Femur 4 dorsal		2	6-8(distal)/2-3(proximal)	

*lotenta* by presence of six eyes, spinated anterior femora and presence of a ridge on vulva ventral arch (VA). It can be distinguished from other species with a ridge on ventral arch (Grancanarian *D. arabisenen* Arnedo & Ribera 1997, *D. tibicena* Arnedo & Ribera 1997 and Tenerifean *D. iguanensis*, *D. montaneten-*

*sis*) by possessing a ridge longer than the ventral arch (Fig. 116).

**Description.**—*Holotype female*: Figs. 113–117, 122, 123. Carapace (Fig. 113) 8.33 mm long; maximum width 6.58 mm; minimum width 3.78 mm. Brownish-orange, frontally darker, becoming lighter towards back; smooth with some small black ‘granules’ mainly at front; hairy, covered with black hairs mainly at lateral and back borders. Frontal border roughly straight, from  $\frac{1}{2}$ – $\frac{3}{5}$  carapace length; anterior lateral borders slightly convergent; sharpened at maximum dorsal width point, back lateral borders straight; back margin wide, straight. Eyes markedly reduced in size; AME diameter 0.16 mm; PLE 0.14 mm; PME 0.12 mm; AME separation 0.52 mm; AME-PLE separation 0.07 mm; PLE-PME separation 0.2 mm; PME separation 0.09 mm. Labium trapezoid-shaped, base wider than distal part; longer than wide at base (rectangle-like); semicircular groove at tip. Sternum orange, frontally darker, becoming lighter towards back; very slightly wrinkled, mainly between legs, frontal border; uniformly covered in slender black hairs.

Chelicerae (Fig. 114) 3.22 mm long, about  $\frac{1}{3}$  of carapace length in dorsal view; fang medium-sized, 2.52 mm; basal segment dorsal, ventral side completely covered with piligerous granulations (small, dense). Chelicera inner groove short, about  $\frac{1}{3}$  cheliceral length; armed with three teeth and lamina at base; D = B > M (large, similar in size); D trapezoid,



Figures 113–117.—*Dysdera labradaensis*. 113, Carapace, dorsal; 114, Left chelicera, ventral; 115, Vulva, dorsal; 116, Vulva, ventral; 117, Vulva, lateral. Scale bars in mm.

located roughly at center of groove; B close to basal lamina; M close to B. Legs dark orange-colored. Lengths of female described above: fe1 7.7 mm (all measurements in mm); pa1 4.9; ti1 7; me1 7.21; ta1 1.12; total 27.93; fe2 7.28; pa2 4.69; ti2 6.72; me2 7; ta2 1.12; total 26.71; fe3 6.3; pa3 3.43; ti3 4.9; me3 6.51; ta3 1.19; total 22.33; fe4 8.4; pa4 4.2; ti4 7.14; me4 9.45; ta4 1.33; total 3.52; relative length  $4 > 1 > 2 > 3$ ; palp: fe 3.92; pa 2.1; ti 2.03; ta 2.38; total 10.43. Spination: palp spineless. Fe1: 3 distal, anterior margin. Fe2: 1-2 distal, anterior margin. Fe3 dorsal spines in two rows: anterior 4-3 (distal); posterior 2-3 (proximal); pa3 1-0 ventral; ti3 dorsal spines arranged in four bands: proximal 1-0.0.0; medial-proximal 1.2-1.1; medial-distal 1.1.0-1; distal 1.0.1; ti3 ventral spines arranged in three bands: proximal 1.1.1; medial-proximal 1.1.1; distal 1.1.1; with two terminal spines. Fe4 dorsal spines in two rows: anterior 5-6 (2 distal); posterior 2-3; ti4 dorsal spines arranged in four bands: proximal 1.2.1; medial-proximal 1.2.1; medial-distal 1.1.1; distal 1.1.1; ti4 ventral spines arranged in four bands: proximal 1.1.2-1; medial-proximal 0-1.0-1.1; medial-distal 1.1.1; distal 2-1.1.1; with two terminal spines. Dorsal side of frontal legs, ventral side of palp slightly covered with a fine-textured piligerous granular surface. Claws with more than 20 teeth, length twice claw width.

Abdomen 9.8 mm long; cream-colored; cylindrical. Abdominal dorsal hairs 0.036–0.072 mm long (small, variable); medium thickness, roughly straight, not compressed, blunt, tip enlarged; uniformly, scantily distributed. Vulva (Figs. 115–117) rectangle-like in dorsal view, frontally rounded; twice as wide as long; DF wide. MF well-developed; markedly sclerotized along its extent. VA frontal region completely sclerotized; posterior region sclerotized except for most internal area; sclerotized ridge at ventral VA external margin, longer than VA, fused to VA along its extent, back ends bent to internal side. AVD clearly recognizable. S attachment projected under VA; arms as long as DA, slightly curved; ends projected anteriorly; neck as wide as arms. TB usual shape. ALS (Figs. 122, 123) with PS; remaining piriform spigots more external than MS, arranged in three rows; more than 20

piriform gland spigots; PMS, PLS with 10–15 aciniform gland spigots.

*Male*: Unknown.

**Intraspecific variation.**—Female cephalothorax ranges in length from 7.00–8.33 mm. B larger than M. Spination variability in Table 10.

**Additional material examined.**—**TENERIFE:** *Icod de los Vinos*: Cueva del Viento-Sobrado, 30 November 1980, 1juv. (J.L. Martín, num. 2522 UL); 5 April 1981, 1juv. (J.L. Martín, num. 2515 UL); 17 September 1990, 1juv. (J.J. Hernández, num. 2746 UL); 17 September 1990, 1juv. (J.J. Hernández, num. 2747 UL); ? May 1994, 1juv. (J. Sala, num. 2802 UL). *La Orotava*: Cueva del Bucio, 4 August 1985, 1juv. (Martín & Machado, num. 2743 UL). *El Sauzal*: Cueva Labrada, 21 March 1983, 1♀, some remains, (J.L. Martín, num. 2531 UL); 28 June 1986, 1♀ (P. Oromí, num. 2513 UL).

**Distribution.**—Tenerifean endemic. Known from several lava tubes located on northern slope of the island.

*Dysdera levipes* Wunderlich 1987

*Dysdera levipes* Wunderlich 1987: 59–60, fig. 19–22 [♂]. -Wunderlich 1991: 284–287. -Arnedo et al. 1996: 258–261, figs. 14A–F, 15A–D, 16A–C [♂, ♀]. -Arnedo & Ribera 1997.

*Dysdera multipilosa* Wunderlich 1991: 301–302, figs. 68–71 [♀].

**Distribution.**—Canarian endemic, found in Tenerife, La Gomera and Gran Canaria. In Tenerife has been reported from two localities on the northern slope and a single locality on middle-southern slope.

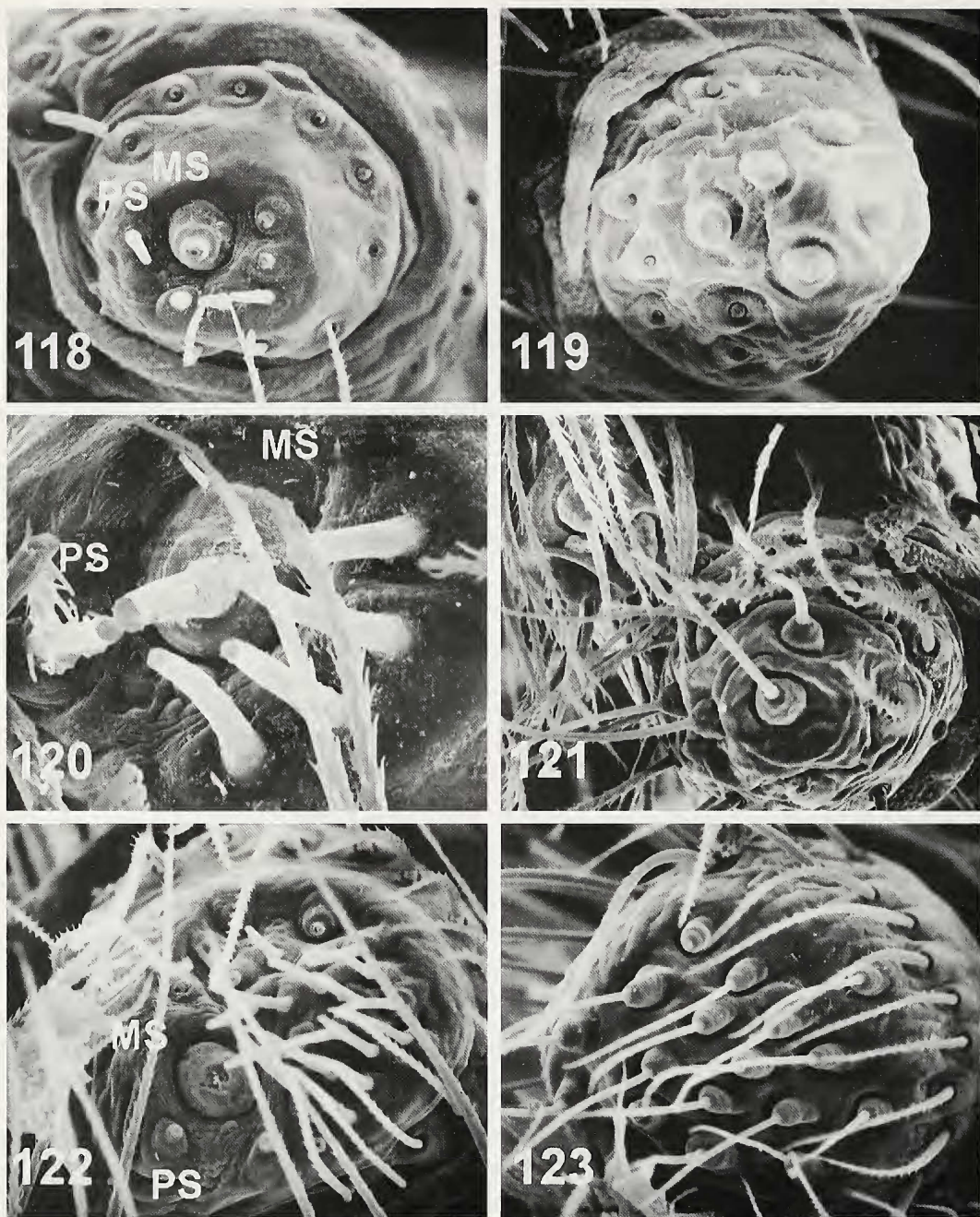
**Comments.**—A complete redescription of this species has been published elsewhere (Arnedo et al. 1996). *D. levipes* is the only endemic species reported from three different islands: La Gomera, Tenerife and Gran Canaria (a single specimen).

*Dysdera macra* Simon 1883

Figs. 124–136, Table 11

*Dysdera macra* Simon 1883: 295–296, fig. 18 [♂] (♂, non ♀). Neotype male, by present designation, from Monte de Santa Ursula, Santa Ursula, Tenerife, Canary Islands; 27 February 1997, P. Oromí leg.; num. 3206; Stored at UB. -Simon 1907: 256–267, 259–260; fig. 3, dorsal [♂]. -Strand 1911: 189. -Reimoser 1919: 200. -Denis 1941: 108. -Schmidt 1973: 360–361. -Arnedo et al. 1996: 272.

*D. teneriffensis* Strand 1908: 772 [♀]. Holotype fe-



Figures 118–123.—Spinnerets. 118, 119, *Dysdera gollumi*. 118, Right ALS; 119, Right PLS. 120–121, *Dysdera hernandezii* new species. 120, Right ALS; 121, Right PLS. 122–123, *Dysdera labradaensis*. 122, Right ALS; 123, Right PLS.

male from Aguamansa (Aqua Manza), La Orotava, Tenerife, Canary Islands; unknown data, unknown leg.. Probably lost. Not examined. -Wunderlich 1991: 283. New synonymy.

*D. pergrada* Wunderlich 1991: 305–306, figs. 83–91 [♂, ♀]. Holotype male from close to La Oro-

tava, La Orotava, Tenerife, Canary Islands; in II, M. Knösel leg.; num. 37163; Stored at SMF Examined. New synonymy.

*D. pseudopergrada* Wunderlich 1991: 306, figs. 94–97 [♂, ♀]. Holotype male from Barranco del Inferno, Adeje, Tenerife, Canary Islands; in II,

Table 11.—Intraspecific spination variability of *Dysdera macra* (hardly distinguishable from spine-like hairs).

	Proximal	Medial-proximal	Medial-distal	Distal
Tibia 3 dorsal	0-1.0.0	0	0	1.0.0

M. Knösel leg.; num. 37168; Stored at SMF Examined. New synonymy.

*D. tabaibaensis* Wunderlich 1991: 308, figs. 103–107 [♂]. Holotype male from Tabaiba, El Rosario, Tenerife, Canary Islands; 25 April 1990, C.G. Campos leg.; num. 03863; Stored at UL. Examined. New synonymy.

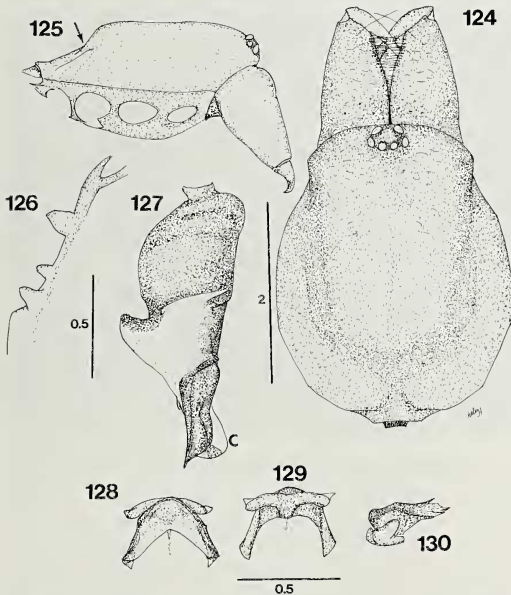
*D. teideensis* Wunderlich 1991: 309–310, figs. 112–118 [♂, ♀]. Holotype male from Retamar del Teide, La Orotava, Tenerife, Canary Islands; 21 April 1984, C.G. Campos leg.; num. 2772; Stored at UL. Examined. New synonymy.

**Diagnosis.**—*Dysdera macra* is distinguished from all other Canarian *Dysdera* species, except *D. brevisetae* and *D. esquiveli*, by a stepped carapace (Fig. 125) and spine-like hairs on legs. It differs from *D. esquiveli* by absence of eye reduction. It is distinguished from *D. brevisetae* in both sexes by possessing less granulation on chelicerae, shorter che-

liceral inner groove and distal and basal cheliceral teeth similar in size, and males by a barely visible lateral sheet (L) on the bulbus (Fig. 131).

**Description.**—*Neotype male*: Figs. 124–126, 131–134. Carapace (Fig. 124) 3.63 mm long; maximum width 2.93 mm; minimum width 2.1 mm. Dark red, uniformly distributed; slightly foveate at borders, wrinkled at middle, covered with a black, fine-textured, granular surface. Frontal border roughly round, about  $\frac{1}{3}$  carapace length; anterior lateral borders slightly convergent; rounded at maximum dorsal width point, back lateral borders straight; back margin narrow, straight; stepped in lateral view (Fig. 125). AME diameter 0.16 mm; PLE 0.14 mm; PME 0.12 mm; AME on edge of frontal border, separated one from another about 1 diameter or more, close to PLE; PME very close to each other, about  $\frac{2}{3}$  PME diameter from PLE. Labium trapezoid-shaped, base wider than distal part; as long as wide at base (triangle-like); semi-circular groove at tip. Sternum dark red, uniformly distributed; slightly wrinkled; uniformly covered in slender black hairs.

Chelicerae (Fig. 126) 1.91 mm long, about  $\frac{1}{3}$  of carapace length in dorsal view; fang medium-sized; 1.3 mm; basal segment smooth, with no granulations. Chelicera inner groove short, about  $\frac{1}{3}$  cheliceral length; armed with three teeth and lamina at base;  $D > B > M$  (large, D markedly larger); D trapezoid, located near segment tip; B close to basal lamina; M close to B. Legs dark orange-colored. Lengths of male described above: fe1 2.42 mm (all measurements in mm); pa1 1.63; ti1 2.19; me1 2; ta1 0.46; total 8.7; fe2 2.19; pa2 1.49; ti2 1.96; me2 1.86; ta2 0.42; total 7.92; fe3 1.77; pa3 1.11; ti3 1.21; me3 1.81; ta3 0.46; total 6.36; fe4 2.37; pa4 1.3; ti4 1.72; me4 2.23; ta4 0.56; total 8.18; relative length:  $1 > 4 > 2 > 3$ ; palp: fe 1.68; pa 0.93; ti 0.74; ta 0.79; total 4.14. Spination: palp, leg1, leg2 spineless. Fe3 dorsal spineless; ti3 dorsal



Figures 124–130.—*Dysdera macra*. 124, Carapace, dorsal; 125, Carapace, lateral; 126, Left chelicera, ventral; 127, Right male bulbus, external; 128, Vulva, dorsal; 129, Vulva, ventral; 130, Vulva, lateral. Scale bars in mm.

spines arranged in one band: distal 1.0.0; ti3 ventral 1 terminal spines. Fe4 dorsal spineless; ti4 dorsal spineless; ti4 ventral 1 terminal spines. Dorsal side of frontal legs smooth; ventral side of palp covered with a fine-textured, piligerous, granular surface; long, spine-like hairs on posterior ti, fe. Claws with 8 teeth or less, robust, length twice claw width.

Abdomen 4.19 mm long; whitish; cylindrical. Abdominal dorsal hairs 0.027 mm long (small); medium thickness, roughly straight, not compressed, blunt, tip enlarged; uniformly, thickly distributed.

Male bulb (Fig. 127): T slightly smaller than DD; external distal border straight; internal sloped backwards. DD slightly bent in lateral view, clearly less than  $45^\circ$ ; internal distal border not expanded. ES more sclerotized than IS; IS truncated at DD middle part; ES bend markedly sclerotized. DD tip (Figs. 131–133) straight in lateral view. C present, short; distal end on DD internal tip; well-developed; located close to DD distal tip; proximal border sharply decreasing; distal border rounded, hardly stepped, upper tip not projected, rounded; external side hollowed. AC present. LF absent. L reduced to distal part; external end projected, pointed. AL present, very poorly developed; proximal border in posterior view fused with DH except for its most internal part. P (Fig. 134) fused to T; perpendicular to T in lateral view; lateral length about  $\frac{1}{4}$  of T width; ridge present, perpendicular to T, not expanded; upper margin markedly toothed, on its distal part, few teeth (4–6); distally slightly projected; back margin not folded.

*Female:* (from Monte de Santa Ursula, S. Ursula, Tenerife; num. 3206, UB). Figs. 128–130, 135, 136. All characters as in male except: Carapace 3.4 mm long; maximum width 2.75 mm; minimum width 2.05 mm. AME diameter 0.16 mm; PLE 0.13 mm; PME 0.12 mm; PME  $\frac{2}{5}$  diameter from PLE. Sternum dark orange, uniformly distributed; very slightly wrinkled, mainly between legs, frontal border.

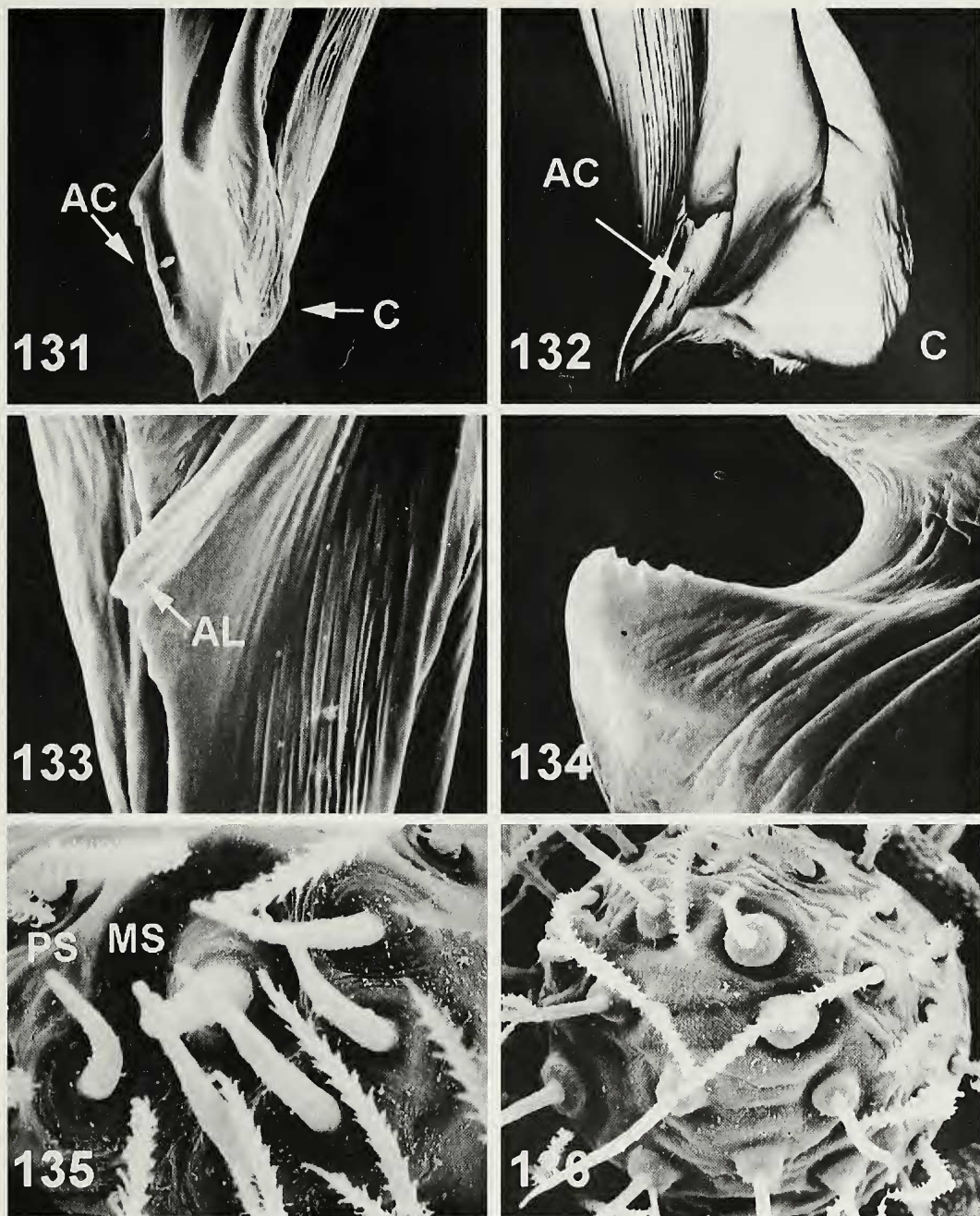
Chelicerae 1.86 mm long; fang 1.26 mm. Leg lengths of female described above: fe1 2.33 mm (all measurements in mm); pa1 1.54; ti1 1.96; me1 1.86; ta1 0.46; total 8.15; fe2 2.14; pa2 1.4; ti2 1.82; me2 1.77; ta2 0.42; total 7.55; fe3 1.77; pa3 1.02; ti3 1.21; me3

1.58; ta3 0.46; total 6.04; fe4 2.14; pa4 1.25; ti4 1.72; me4 1.96; ta4 0.51; total 7.58; relative length  $1 > 4 > 2 > 3$ ; palp: fe 1.4; pa 0.7; ti 0.56; ta 0.74; total 3.4. Spination: palp, leg1, leg2 spineless. Fe3 dorsal spineless; ti3 dorsal spines arranged in two bands: proximal 1.0.0; distal 1.0.0-1; ti3 ventral 2 terminal spines. Fe4 dorsal spineless; ti4 dorsal spineless; ti4 ventral 2 terminal spines.

Abdomen 4.19 mm long; whitish; cylindrical. Abdominal dorsal hairs 0.072–0.108 mm long; medium thickness, curved, compressed, blunt, tip enlarged; uniformly, thickly distributed. Vulva (Figs. 128–130) arch-like in dorsal view, frontally rounded; slightly wider than long; DF wide. MF poorly developed. VA frontal region completely sclerotized; posterior region sclerotized at anterior area. AVD hardly visible. S attachment not projected under VA; arms as long as DA, clearly curved; tips not projected; neck as wide as arms. TB usual shape. ALS (Figs. 135, 136) with PS; remaining piriform spigots more external than MS, arranged in one row; 4 + 1 piriform gland spigots; PMS, PLS with 5–10 aciniform gland spigots.

**Intraspecific variation.**—Male cephalothorax ranges in length from 2.75–3.63 mm, female from 2.93–3.45 mm. Carapace frontal lateral borders slightly convergent or parallel. AME separation from  $\frac{2}{3}$ –1 diameter PLE-PME separation from  $\frac{1}{3}$ – $\frac{2}{3}$  diameter. Sternum ornamentation variable, from smooth to slightly wrinkled. Chelicerae relative length from  $\frac{1}{3}$ – $\frac{2}{5}$ . Basal segment lacking dorsal granulations, reduced to basal portion, or at distal internal margin. Chelicera inner groove from  $\frac{1}{3}$ – $\frac{2}{5}$  its length. Fang relative size from  $\frac{1}{3}$ – $\frac{2}{5}$ . D only slightly larger than or as large as B. P relative size from  $\frac{1}{4}$ – $\frac{2}{5}$ . Female abdominal dorsal hair blunt, enlarged at frontal part and becoming pointed, longer to back. Spination variation given in Table 11.

**Additional material examined.**—**TENERIFE:** *Arafo:* 3 km N of Arafo, 950 m; 28 December 1994, 2♂ (F. Gasparo, FG). Fuente del Joco, 5 km NW of Arafo, 1930 m, 28 December 1994, 1♀ (F. Gasparo, FG). *Adeje:* Roque del Conde, 16 March 1996, 1♂ (Oromí, num. 3121 UB); 16 March 1996, 1♀ (Oromí, num. 3122 UB). *Arico:* Barranco del Rio, 14–21 April 1981, 1♂1♀, (J.M. Peraza, num. 2612 MCNT); 16–23 November 1984, 1♂ (J.M. Peraza, num. 2609 MCNT); 29 November 1993, 1♂ (M.A. Arnedo, num. 2576 UB). *El Rosario:* Ta-



Figures 131–136.—*Dysdera macra*, right male bulb and female spinnerets. 131, DD frontal; 132, DD external; 133, DD posterior; 134, P external; 135, Right ALS; 136, Right PLS.

baiba, MSS-2, 9 October 1990, 1 juv. (A.L. Medina, num. 2775 UL). *La Victoria de Acentejo*: El Diabillillo, 21 February 1997, 1 ♀, (P. Oromí, num. 3207 UB). Las Lagunetas, 28 January 1993, 1 ♂ (P. Oromí, num. 2547 UL); 27 March 1995, 1 ♀ (P. Oromí, num. 4110 UB). *Guía de Isora*: Above

Chío, 750 m, 28 December 1994, 2 ♂ 1 ♀, (F. Gasparo, FG). *Güímar*: Barranco del Agua, 14 January 1984, 1 ♀ (P. Oromí, num. 2681 UL); 17 January 1997, 1 ♀, (P. Oromí, num. 3194 UB). Barranco de Badajoz, 1900 m, 18 December 1996, 1 ♀ (P. Oromí, num. 3190 UB); 1800 m, 27 December



1996, 1 ♀ (P. Oromí, num. 3195 UB). *La Orotava*: Base del zig-zag, 17 October 1984, 2 ♀ (C.G. Campos, num. 2697 UL). Close to the Refugio, 2200 m, in VI, 1 ♂ 1 ♀ (C.G. Campos, num. 2627 SMF). Izaña, November 1994, 1 ♀, (Arnedo, num. 4827 (T40) UB). La Rosa de Piedra, 25 February 1996, 1 ♂, (Oromí & Emerson, num. 3126 UB). Las Cañadas del Teide, ?, 1 ♂ (A. Machado, num. 2808 UB); 17 May 1983, 1 ♀, (C.G. Campos, num. 2686 UL); 14 May 1993, 1 ♀ (P. Oromí, num. 2817 UB); 12 December 1993, 1 juv. (Oromí, num. 4837 (T52) UL); 3 June 1995, 1 ♂ (P. Oromí, num. 2969 UB); 11 June 1995, 1 ♀ (P. Oromí, num. 2968 UB); 24 May 1996, 1 ♀ (N. Zurita, num. 3173 UB). Teide, 2700m, 21 April 1984, 1 ♂ (C.G. Campos, num. 2766 UL). *Los Realejos*: La Fortaleza, 1 July 1990, 1 ♀ (C.G. Campos, num. 2760 UL). 17 May 1996, 1 juv. (N. Zurita, num. 3155 UB); 1 ♀ (A. Camacho, num. 3157 UB); 1 juv. (N. Zurita, num. 3158 UB); 1 ♀ (A. Camacho, 3156 UB). Roque Peral, 9 November 1983, 1 ♂ (C.G. Campos, num. 2701 UL); 19 April 1984, 1 ♂ (C.G. Campos, num. 2718 UL); 12 June 1984, 1 ♀ (C.G. Campos, num. 2693 UL); 18 June 1984, 2 ♂ (C.G. Campos, num. 2694 UL). *Santa Ursula*: Barranco del Pino, 15 November 1984, 1 ♀ (J.P. Peraza, num. 2737 UL). Monte de Santa Ursula, 13 December 1996, 3 ♂ 3 ♀ (P. Oromí, num. 3212 UB). *Vilaflor*: El Pinalito, 16–23 February 1985, 1 ♂ 1 ♀, (J.M. Peraza, num. 2610 MCNT); 24–31 May 1985, 1 ♂ (J.M. Peraza, num. 2611 MCNT). Madre del Agua, 15 March 1990, 1 ♂ (C.G. Campos, num. 2717 UL). *Dysdera teideensis*: **TENERIFE**: *La Orotava*: Retamar del Teide, 21 April 1984, 1 ♂ paratype (C.G. Campos, num. 2624 SMF). Las Cañadas del Teide, 18 October 1984, 1 ♀ paratype (C.G. Campos, num. 2719 UL). Teide, 3050 m, 21 April 1984, 1 ♂ paratype (C.G. Campos, num. 2703 UL).

**Distribution.**—Tenerifean endemic. A widespread species, collected throughout the island with the exception of Anaga and Teno massifs.

**Comments.**—The distribution of *D. macra* was unknown before the present study. Neither the original description (Simon 1883) nor the redescription of the species (Simon 1907) made any reference to its locality. Moreover, the report of this species in La Gomera by Strand (1911) has been claimed to be wrong (Arnedo et al. 1996).

The only type material of this species that was available for studying was a juvenile, probably the one originally described by Simon (1883) as the female of *D. macra*. However, in a subsequent article (Simon 1907) the same author transferred this specimen to *D.*

*crocata*. Fortunately, in this particular case both the original description and later redescription allowed the identification of the specimens belonging to this species. Arnedo et al. (1996) considered *D. macra* as a distinctive species on the basis of a double-toothed P. However, reexamination under SEM of some specimens formerly determined as *D. pergrada* and *D. teideensis* showed the presence of this character.

In their original descriptions (Wunderlich 1991), *D. pergrada*, *D. pseudopergrada*, *D. tabaibaensis* and *D. teideensis* were distinguished by: size of abdominal dorsal hairs, distal structures of the bulb and curvatures of P. In addition, *D. tabaibaensis* displayed a shorter distance between AME and relatively larger M tooth. Examination of the type material of these species, together with the study of about 40 newly available specimens, showed that (1) most of the formerly listed characters are polymorphic within the populations, (2) the suggested differences in the distal structures of the bulb simply do not exist and (3) the only truly distinguishable character, although present only in a single specimen, is the shorter AME distance of *D. tabaibaensis*, which seems to fit better that of *D. brevisetae*. However, both male genitalia and the remaining somatic characters of *D. tabaibaensis* correspond to those exhibited by the rest of the mentioned species. Finally, because all these species are compatible with the descriptions of *D. macra* and in order to avoid unnecessary proliferation of names, the preferred option has been to synonymize all these species with *D. macra*.

The *Dysdera teneriffensis* holotype seems to have been lost. Strand's original description is fully fitted by both *D. brevisetae* and *D. macra*. However, because the type locality (Aguamansa) is located into the distributional range of the second species, *D. teneriffensis* is better considered as a synonym of *D. macra*.

*Dysdera minutissima* Wunderlich 1991  
Figs. 137–147, Table 12

*Dysdera minutissima* Wunderlich 1991: 299–300, fig. 61–62 [♂]. Holotype male from Aguamansa, La Orotava, Tenerife; 5 March 1987, H. Enghoff leg.; num. 2676; Stored at ZMK. Examined. - Wunderlich 1991: 284–287.

**Diagnosis.**—*Dysdera minutissima* is distinguished from most of the other Canarian *Dys-*

Table 12.—Intraspecific spination variability of *Dysdera minutissima*.

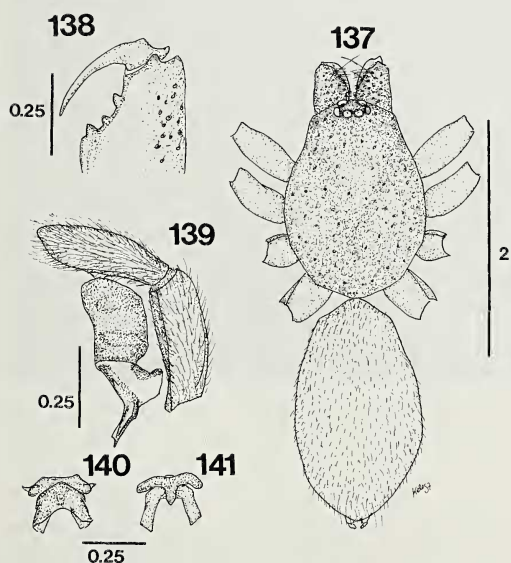
	Proximal	Medial-proximal	Medial-distal	Distal
Tibia 3 dorsal	1.0.0	0	0	1.0.0
Tibia 4 dorsal	0.0.0-1	0	0	0.0.0-1
Tibia 3 ventral	0	0	0	0
Tibia 4 ventral	0.0-1.0	0	0	0

*dera* species by its small size (carapace ~ 2.00 mm long) and markedly wrinkled carapace. In both sexes, it differs from the similar Tenerifean *D. levipes* and *D. gollumi* by having chelicerae with a granular surface, shorter cheliceral groove and spinated posterior legs. In males, the bulb distal division (DD) is longer than the tegulum (T) (Fig. 139) and the lateral sheet (L) has a distinct shape (Fig. 142). Males are distinguished from Grancanarian *D. andamanae* Arnedo & Ribera 1997 by absence of a lateral fold (LF) in bulb. In both sexes, it differs from *D. paucispinosa* Wunderlich 1991 from Gran Canaria and *D. orahan* Arnedo, Oromí & Ribera 1996 from La Gomera by possessing cheliceral granulation.

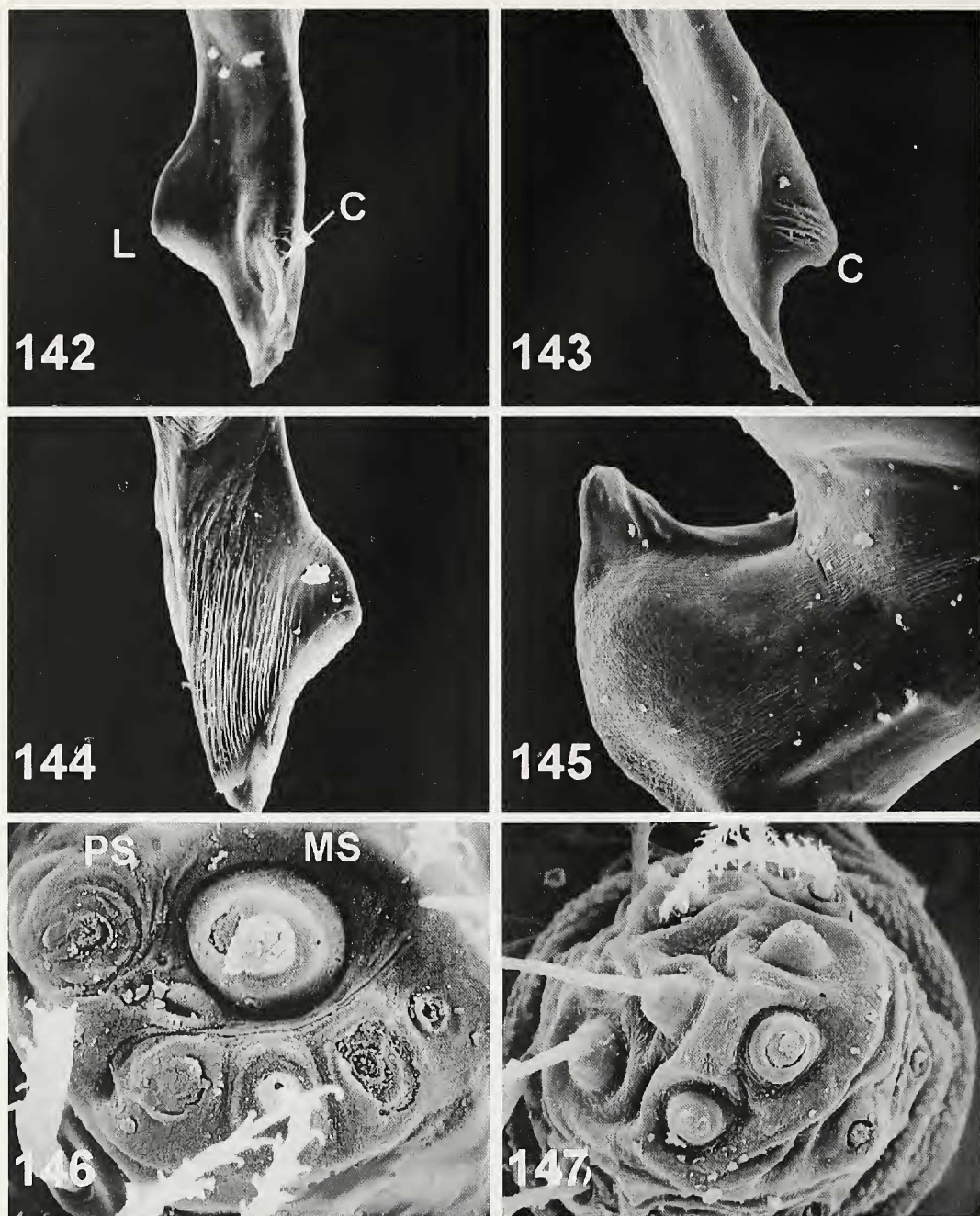
**Description.**—*Holotype male*: Figs. 137–139, 142–145. Carapace (Fig. 137) 1.49 mm long; maximum width 1.14 mm; minimum

width 0.74 mm. Dark red, darkened at borders; heavily wrinkled, foveate, covered with tiny granulations; hairy, covered with black hairs mainly at lateral and back borders. Frontal border roughly triangular, markedly smaller than  $\frac{1}{2}$  carapace length; anterior lateral borders divergent; rounded at maximum dorsal width point, back lateral borders straight; back margin narrow, straight. AME diameter 0.11 mm; PLE 0.09 mm; PME 0.09 mm; AME on edge of frontal border, separated one from another about  $\frac{1}{2}$  of diameter, close to PLE; PME very close to each other, about  $\frac{1}{3}$  PME diameter from PLE. Labium trapezoid-shaped, base wider than distal part; longer than wide at base (triangle-like); semicircular groove at tip. Sternum dark red, uniformly distributed; heavily wrinkled; uniformly covered in slender black hairs.

Chelicerae (Fig. 138) 0.53 mm long, about  $\frac{1}{4}$  of carapace length in dorsal view; fang short, 0.32 mm; basal segment dorsal, ventral side completely covered with large piligerous granulations. Chelicera inner groove short, about  $\frac{1}{3}$  cheliceral length; armed with three teeth and lamina at base; D = M = B; D trapezoid, located roughly at center of groove; B close to basal lamina; M close to B. Legs pale yellow, darkened frontal, proximally. Lengths of male described above: fe1 1.26 mm (all measurements in mm); pa1 0.77; ti1 1.01; me1 0.97; ta1 0.35; total 4.36; fe2 1.13; pa2 0.77; ti2 0.9; me2 0.9; ta2 0.32; total 4.02; fe3 0.97; pa3 0.46; ti3 0.61; me3 0.83; ta3 0.3; total 3.17; fe4 1.22; pa4 0.63; ti4 0.99; me4 1.19; ta4 0.37; total 4.33; relative length: 1 = 4 > 2 > 3; palp: fe 0.79; pa 0.37; ti 0.39; ta 0.42; total 1.97. Spination: palp, leg1, leg2 spineless. Fe3 dorsal spineless; ti3 dorsal spines arranged in two bands: proximal 1.0.0; distal 1.0.0; ti3 ventral spines spineless; with two terminal spines. Fe4 dorsal spineless; ti4 dorsal spines arranged in two bands: proximal 0.0.1; distal 0.0.1; ti4 ventral spines arranged



Figures 137–141.—*Dysdera minutissima*. 137, Carapace, dorsal; 138, Left chelicera, ventral; 139, Left male bulb, external; 140, Vulva, dorsal; 141, Vulva, ventral. Scale bars in mm.



Figures 142–147.—*Dysdera minutissima*, right male bulb and female spinnerets. 142, DD frontal; 143, DD external; 144, DD posterior; 145, P external; 146, Right ALS; 147, Right PLS.

in one band; proximal 0.0–1.0; with two terminal spines. Dorsal side of frontal legs covered with a fine-textured, piligerous, granular surface; ventral side of palp covered with hairs, lacking a granular surface. Claws with 10–14 teeth, slender, length twice claw width.

Abdomen 1.77 mm long; whitish; globular. Abdominal dorsal hairs 0.036–0.045 mm long; thin, curved (?), compressed (?), pointed; uniformly, thickly distributed.

Male bulb: (Fig. 139). T slightly longer than DD; external, internal distal border

Table 13.—Intraspecific spination variability of *Dysdera montanetensis*.

	Proximal	Medial-proximal	Medial-distal	Distal
Tibia 3 dorsal	1.1-2.0-1	0.1-2.0-1	0	1.0.0-1
Tibia 4 dorsal	0-1.0-1.1	1.1-2.1	0	1.1-2.1
Tibia 3 ventral	1.2.0-1	0	0	1.0-1.0-1
Tibia 4 ventral	1.1.1	0-1.0-1.0-1	0.0-2.0-1	1.0-1.1
	Number of rows		Number of spines	
Femur 3 dorsal	1		0-1	
Femur 4 dorsal	1		1-4	

sloped backwards. DD bent about 45° in lateral view; internal distal border not expanded. ES wider, more sclerotized than IS; IS continuous to tip (?). DD tip (Figs. 142–144) straight in lateral view. C present, short; distal end on DD internal tip; well-developed; located far from DD distal tip; proximal border continuously decreasing; distal border sloping in its base, upper tip projected, rounded; external side smooth. AC absent. LF absent. L well-developed; external border not sclerotized, not folded; distal border divergent, continuous. AL absent. P (Fig. 145) fused to T; markedly sloped on its proximal part, perpendicular on distal; lateral length from  $\frac{1}{2}$ – $\frac{2}{3}$  of T width; ridge present, perpendicular to T, not expanded; upper margin markedly toothed, on its distal part, very few teeth (1–3); not distally projected; back margin not folded.

*Female*: (from Barranco del Pino, Santa Ursula, Tenerife; num. 2614, MCNT), Figs. 140–141, 146, 147. All characters as in male except: Carapace 1.68 mm long; maximum width 1.26 mm; minimum width 0.74 mm. Dark brownish-red. AME diameter 0.11 mm; PLE 0.09 mm; PME 0.08 mm; AME separated one from another about  $\frac{2}{3}$  of diameter. Sternum brownish-red; heavily wrinkled.

Chelicerae 0.53 mm long; fang 0.37 mm. Leg lengths of female described above: fe1 1.24 mm (all measurements in mm); pa1 0.7; ti1 1.04; me1 0.99; ta1 0.35; total 4.32; fe2 1.15; pa2 0.77; ti2 0.9; me2 95; ta2 0.32; total 4.09; fe3 1.01; pa3 0.51; ti3 0.65; me3 0.86; ta3 0.3; total 3.33; fe4 1.35; pa4 0.65; ti4 1.08; me4 1.28; ta4 0.37; total 4.73; relative length  $4 > 1 > 2 > 3$ ; palp: fe 0.65; pa 0.37; ti 0.37; ta 0.48; total 1.87. Spination: palp, leg1, leg2 spineless. Fe3 dorsal spineless; ti3 dorsal spines arranged in two bands: proximal 1.0.0; distal 1.0.0; ti3 ventral spines spineless; with

one terminal spine on anterior margin. Fe4 dorsal spineless; ti4 dorsal spines arranged in two bands: proximal 0.0.1; distal 0.0.1; ti4 ventral spines arranged in one band: proximal 0.1-0.0; with two terminal spines.

Abdomen 1.96 mm long; whitish; globular. Abdominal dorsal hairs 0.054–0.063 mm long; thin, curved, compressed, pointed; uniformly, thickly distributed. Vulva (Figs. 140, 141) arch-like in dorsal view, frontally pointed; as wide as long; DF wide. VA frontal region completely sclerotized. S attachment projected under VA; arms as long as DA, clearly curved; tips dorsally projected; neck as wide as arms. TB usual shape. ALS (Figs. 146, 147) with PS; remaining piriform spigots more external than MS, arranged in one row; 4 + 1 piriform gland spigots; PMS, PLS with 5–10 aciniform gland spigots.

**Intraspecific variation.**—Male cephalothorax ranges in length from 1.49–1.54 mm. AME separation from  $\frac{1}{2}$ – $\frac{4}{5}$  diameter. PLE-PME from  $\frac{1}{3}$ – $\frac{2}{3}$  diameter apart. Cheliceral teeth very similar in size.  $D > B > M$ . Spination variability in Table 12.

**Additional material examined.**—TENERIFE: *Santa Ursula*: Barranco del Pino, 21–28 July 1985, 1♂ (J.M. Peraza, num. 2615 MCNT).

**Distribution.**—Tenerifean endemic. Known from two localities on middle-northern slope of the island.

**Comments.**—Female specimens of this species were formerly unknown. Unfortunately, during manipulation of the only available vulva it was lost. The character states reported for the vulva in the present work are based on preliminary drawings made before its loss.

*Dysdera montanetensis* Wunderlich 1991  
Figs. 148–159, Table 13

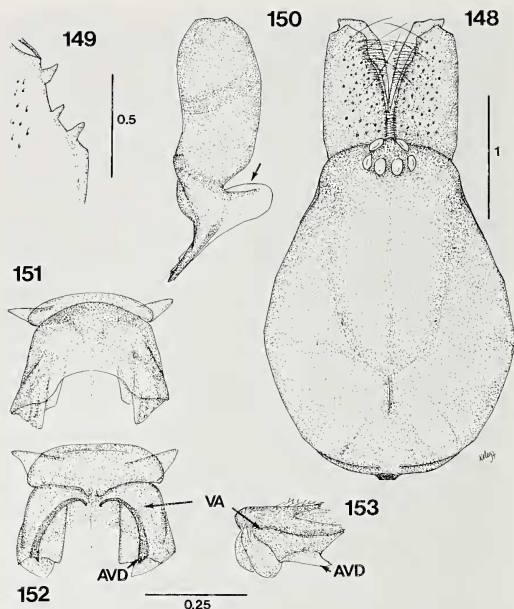
*Dysdera montanetensis* Wunderlich 1991: 300–301, fig. 63–64 [♂]. Holotype male from La Monta-

ñeta, MSS 6-9, Garachico, Tenerife; 26 April 1988, A.L. Medina leg.; num. T-64-17; Stored at UL. Examined. -Wunderlich 1991: 284-287.

**Diagnosis.**—*Dysdera montanetensis* males are distinguished from most other Canarian species by a distinctly expanded, unsclerotized upper margin of posterior apophysis (P) (also present in *D. gibbifera* and *D. volcania*) (Fig. 150) in the male bulb. Females are distinguishable by the presence of ridges on vulva ventral arch (VA) (Figs. 152, 153) (also present in *D. labradaensis* and *D. iguanensis*). *Dysdera montanetensis* differs from *D. gibbifera* by its smaller size, markedly spinated legs and, in males, by lack of lateral sheet (L) sclerotization (Fig. 155). Males and females are distinguished from *D. volcania* by possessing smooth carapace and markedly spinated legs, from *D. iguanensis* by more distal location of cheliceral distal tooth (Fig. 149) and distinct spination pattern (Table 13) and from *D. labradaensis* by smaller size and lack of eye reduction.

**Description.**—*Holotype male*: Figs. 148-150, 154-157. Carapace (Fig. 148) 2.98 mm long; maximum width 2.35 mm; minimum width 1.37 mm. Brownish-orange, uniformly distributed; slightly foveate at borders, wrinkled at middle, covered with tiny granulations. Frontal border roughly round, markedly smaller than  $\frac{1}{2}$  carapace length; anterior lateral borders slightly divergent or parallel; rounded at maximum dorsal width point, back lateral borders straight; back margin wide, straight. AME diameter 0.18 mm; PLE 0.18 mm; PME 0.12 mm; AME on edge of frontal border, separated one from another about  $\frac{1}{2}$  diameter, close to PLE; PME very close to each other, about  $\frac{1}{3}$  PME diameter from PLE. Labium trapezoid-shaped, base wider than distal part; longer than wide at base (rectangle-like); semicircular groove at tip. Sternum brownish-orange, frontally darker, becoming lighter towards back; wrinkled; covered in hairs mainly on margin.

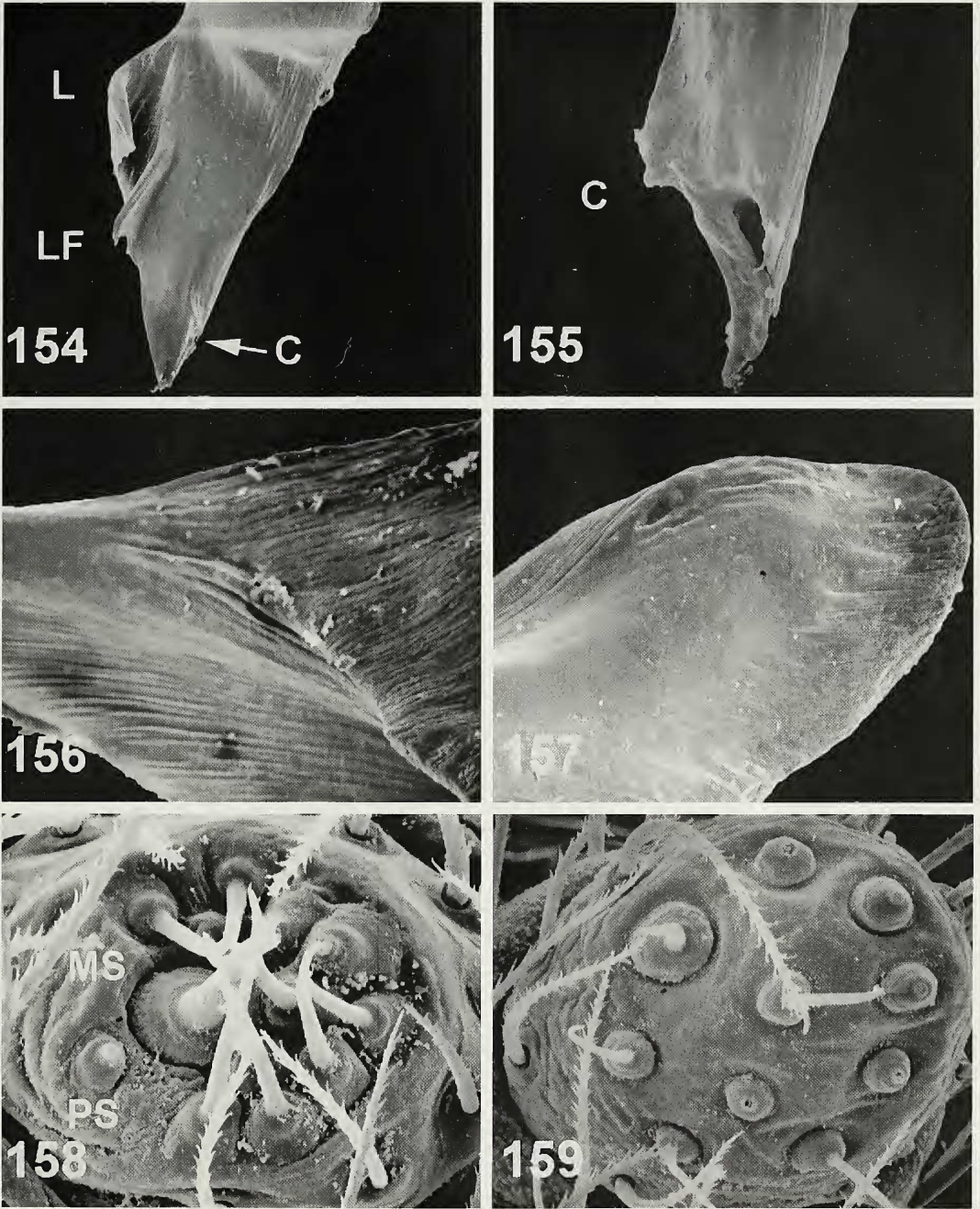
Chelicerae (Fig. 149) 1.21 mm long, about  $\frac{1}{3}$  of carapace length in dorsal view; fang short, 0.84 mm; basal segment dorsal, ventral side completely covered with large piligerous granulations. Chelicera inner groove short, about  $\frac{1}{3}$  cheliceral length; armed with three teeth and lamina at base;  $D > B > M$  (large, not very different); D trapezoid, located near segment



Figures 148-153.—*Dysdera montanetensis*. 148, Carapace, dorsal; 149, Right chelicera, ventral; 150, Right male bulb, internal; 151, Vulva, dorsal; 152, Vulva, ventral; 153, Vulva, lateral. Scale bars in mm.

tip; B close to basal lamina; M at middle of B and D. Legs yellow, frontal slightly darker. Lengths of male described above: fe1 2.75 mm (all measurements in mm); pa1 1.72; ti1 2.42; me1 2.47; ta1 0.74; total 10.1; fe2 2.7; pa2 1.63; ti2 2.28; me2 2.42; ta2 0.74; total 9.77; fe3 2.28; pa3 1.21; ti3 1.64; me3 2.16; ta3 0.7; total 7.98; fe4 3.17; pa4 1.54; ti4 2.47; me4 3.17; ta4 0.79; total 11.09; relative length:  $4 > 1 > 2 > 3$ ; palp: fe 1.35; pa 0.74; ti 0.93; ta 0.84; total 3.86. Spination: palp, leg1, leg2 spineless. Fe3 dorsal spines in one row: 1; ti3 dorsal spines arranged in three bands: proximal 1.1.1; medial-proximal 0.2.0-1; distal 1.0.0-1; ti3 ventral spines arranged in two bands: proximal 1.2.1-0; distal 1.0.0-1; with two terminal spines. Fe4 dorsal spines in one row: 2-3; ti4 dorsal spines arranged in three bands: proximal 0-1.1.1; medial-proximal 1.1-2.1; distal 1.2.1; ti4 ventral spines arranged in four bands: proximal 1.1.1; medial-proximal 1-0.1.0; medial-distal 0.1.0; distal 1.1.1; with two terminal spines. Dorsal side of frontal legs, ventral side of palp with a fine-textured, piligerous, granular surface. Claws with more than 15 teeth, slender, length twice claw width.

Abdomen 3.03 mm long; whitish; cylindri-



Figures 154–159.—*Dysdera montanetensis*, right male bulb and female spinnerets. 154, DD frontal; 155, DD internal; 156, DD posterior; 157, P internal; 158, Right ALS; 159, Right PLS.

cal. Abdominal dorsal hairs 0.072 mm long; thick, slightly curved, not compressed, blunt, tip not enlarged; uniformly, scantily distributed.

Male bulb (Fig. 150): T slightly longer than DD; external, internal distal border sloped

backwards. DD bent about 45° in lateral view; internal distal border not expanded. IS and ES equally developed; IS continuous to tip (?). DD tip (Figs. 154–156) straight in lateral view. C present, short; distal end on DD internal tip; poorly developed; located far from

DD distal tip; proximal border continuously decreasing; distal border sloping in its base, upper tip not projected, pointed; external side hollowed. AC absent. LF present; distally projected; well-developed. L well-developed; external border not sclerotized, laterally markedly folded; distal border divergent, continuous. AL absent. P (Fig. 157) fused to T; markedly sloped on its proximal part, perpendicular on distal; lateral length as long as or longer than T width; ridge present, not sclerotized, perpendicular to T, distinctly expanded, rounded; upper margin smooth; not distally projected; back margin not folded.

*Female:* (from Cueva Labrada, El Sauzal, Tenerife; num. 2519, UL; Figs. 151–153, 158, 159.) All characters as in male except: Carapace 3.35 mm long; maximum width 2.57 mm; minimum width 1.58 mm. Anterior lateral borders divergent. AME diameter 0.21 mm; PLE 0.2 mm; PME 0.14 mm.

Chelicerae 1.35 mm long, fang 0.93 mm. Leg lengths of female described above: fe1 2.93 mm (all measurements in mm); pa1 1.91; ti1 2.56; me1 2.56; ta1 0.74; total 10.7; fe2 2.89; pa2 1.77; ti2 2.42; me2 2.56; ta2 0.79; total 10.43; fe3 2.28; pa3 1.4; ti3 2.16; me3 2.33; ta3 0.79; total 8.89; fe4 3.54; pa4 1.77; ti4 2.76; me4 3.54; ta4 0.98; total 12.59; relative length  $4 > 1 > 2 > 3$ ; palp: fe 1.54; pa 0.84; ti 0.74; ta 1.16; total 4.28. Spination: palp, leg1, leg2 spineless. Fe3 dorsal spines in one row: 1; ti3 dorsal spines arranged in three bands: proximal 1.1.1-0; medial-proximal 0.1-2.0-1; distal 1.0.0-1; ti3 ventral spines arranged in two bands: proximal 1.2.0; distal 1.0-1.1-0; with two terminal spines. Fe4 dorsal spines in one row: 1-3; ti4 dorsal spines arranged in three bands: proximal 0-1.0.1; medial-proximal 1.2.1; distal 1.2.1; ti4 ventral spines arranged in three bands; proximal 1.1.1; medial-proximal 0; medial-distal 0.1-2.0; distal 1.0.1; with two terminal spines.

Abdomen 6.52 mm long; whitish; cylindrical. Abdominal dorsal hairs 0.09 mm long; medium thickness, slightly curved, not compressed, blunt, tip not enlarged; uniformly, scantily distributed. Vulva (Figs. 151–153) rectangle-like in dorsal view, frontally rounded; slightly wider than long; DF wide. MF well-developed; sclerotized along its extent. VA frontal region completely sclerotized; posterior region sclerotized except for most internal area; sclerotized ridge at ventral VA ex-

ternal margin, as long as VA. AVD clearly recognizable. S attachment projected under VA; arms as long as DA, straight; tips dorsally projected; neck as wide as arms. TB usual shape. ALS (Figs. 158, 159) with PS; remaining piriform spigots no more external than MS, arranged in three rows; 10 + 1 piriform gland spigots; PMS, PLS with 5–10 aciniform gland spigots.

**Intraspecific variation.**—Male cephalothorax ranges in length from 2.98–3.07 mm., female from 2.93–4.00 mm. AME separation from  $\frac{1}{2}$ – $\frac{2}{3}$  of diameter. PLE-PME from  $\frac{1}{3}$ – $\frac{1}{2}$  diameter apart. D markedly larger than or as large as B. Usually, teeth large, not markedly different. In some females (Teno, Labrada) abdomen hairs are compressed and pointed. Vulva as wide as long. Labrada female specimen #2516 shows carapace frontal lateral margins parallel, long. Carapace, sternum ornamentation nearly smooth. Strong reduction in eye size. D at center of the chelicera groove. Reduction in leg pigmentation, spination: absence of fe spination and ti medial spination. Spination variation given in Table 13.

**Additional material examined.**—**TENERIFE:** *El Rosario:* Las Raíces, ? November 1993, 1 ♀ (Arnedo & Ribera, num. 4795 UB). *La Orotava:* Agumansa, MSS, 4 August 1985, 1 ♂ (J.L. Martín & A. Machado, num. 2580 UL). *El Sauzal:* Cueva Labrada, 4 November 1991, 1 ♀, (J.L. Martín, num. 2516 UB). *Los Silos:* Monte del Agua, 24 February 1997, 1 ♀ (N. Zurita, num. 3209 UB). *Vilaflor:* Fuente de Mesa, 9 March 1984, 1 ♀ (J.M. Peraza, num. 2770 UL).

**Distribution.**—Tenerifean endemic. Known from several localities spread throughout the northern slope excepting Anaga massif, and from a single locality at middle-southern slope.

**Comments.**—Former knowledge of this species was restricted to a single male specimen.

*Dysdera propinqua* Ribera, Ferrández & Blasco 1985

Figs. 160–172, Table 14

*Dysdera propinqua* Ribera, Ferrández & Blasco 1985: 61–63, fig. 4A–D [♂]. Holotype male from Cueva Honda, Güümar, Tenerife; 15 December 1982, J.L. Martín leg.; num. T-CH-14; Stored at UL. Examined. -Wunderlich 1991: 284–287. Examined.

*D. nesiotis:* Simon 1907: 260 (♀, non ♂). Simon

Table 14.—Intraspecific spination variability of *Dysdera propinqua*.

	Proximal	Medial-proximal	Medial-distal	Distal
Tibia 3 dorsal	1.0-1.0-1	0	0	1.0.0
Tibia 4 dorsal	0-1.0.1	0	0	0.0.1
Tibia 3 ventral	0.0-1.0	0	0	0
Tibia 4 ventral	0.0-1.0	0	0	0
	Number of rows		Number of spines	
Femur 3 dorsal	0		0	
Femur 4 dorsal	2		0-1/1-4	

1883: 297 (*D. insulana* ♀, non ♂) 3 type females, unknown locality, Canary Islands; unknown data, M. Verneau leg.; num. B-536; Stored at MNHN. Examined. Incorrect identification.

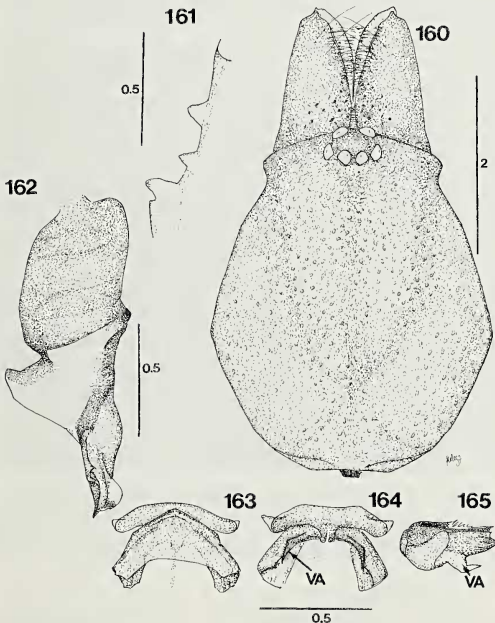
*D. obscuripes* Wunderlich 1991: 302–303, figs. 72–76 [♂, ♀]. Holotype male from pine forest close to La Orotava, La Orotava, Tenerife, Canary Islands; in II., M. Knösel leg.; Stored at SMF. Holotype not examined, paratypes examined. New synonymy.

**Diagnosis.**—*Dysdera propinqua* is distinguished, in both sexes, from most other Canarian species by a combination of markedly

foveate carapace, convergent anterior lateral carapace borders and poorly spinated posterior legs. Males and females differ from the similar and sympatric *D. cribellata*, by the basal cheliceral teeth not being the largest and presence of cheliceral granulation. *Dysdera propinqua* males differ from *D. cribellata* by lacking a fold in the lateral sheet (L) of the bulb, and in females by presence of tooth-shaped expansions in the vulval ventral arch (VA) (Figs. 164, 165).

**Description.**—*Holotype male*: Figs. 160–162, 166–170. Carapace (Fig. 160) 4.1 mm long; maximum width 3.4 mm; minimum width 2.17 mm. Dark red, darkened at borders; foveate at borders, slightly wrinkled at middle, with a black, fine-textured, granular surface; hairy, covered with black hairs mainly at lateral and back borders. Frontal border roughly triangular, from  $\frac{1}{2}$ – $\frac{2}{3}$  carapace length; anterior lateral borders convergent; rounded at maximum dorsal width point, back lateral borders straight; back margin wide, straight. AME diameter 0.27 mm; PLE 0.25 mm; PME 0.18 mm; AME on edge of frontal border, separated one from another about  $\frac{2}{5}$  of diameter, close to PLE; PME very close to each other, about  $\frac{1}{3}$  PME diameter from PLE. Labium trapezoid-shaped, base wider than distal part; longer than wide at base (triangle-like); semi-circular groove at tip. Sternum dark red, darkened on borders; mostly wrinkled, except in middle part; uniformly covered in slender black hairs.

Chelicerae (Fig. 161) 2.1 mm long, about  $\frac{2}{5}$  of carapace length in dorsal view; fang medium-sized, 1.47 mm; basal segment dorsal side completely covered with piligerous granulations, ventral side smooth (spacing distally reduced). Chelicera inner groove short, about



Figures 160–165.—*Dysdera propinqua*. 160, Carapace, dorsal; 161, Left chelicera, ventral; 162, Right male bulb, external; 163, Vulva, dorsal; 164, Vulva, ventral; 165, Vulva, lateral. Scale bars in mm.



$\frac{1}{2}$  cheliceral length; armed with three teeth and lamina at base;  $D = B > M$ ; D round, located roughly at center of groove; B close to basal lamina; M close to B. Legs orange. Lengths of male described above: fe1 3.92 mm (all measurements in mm); pa1 2.65; ti1 3.54; me1 3.41; ta1 0.76; total 14.28; fe2 3.36; pa2 2.4; ti2 2.96; me2 3.16; ta2 0.76; total 12.64; fe3 2.6; pa3 1.49; ti3 1.89; me3 2.4; ta3 0.58; total 8.96; fe4 3.46; pa4 1.89; ti4 2.76; me4 3.21; ta4 0.83; total 12.15; relative length:  $1 > 2 > 4 > 3$ ; palp: fe 1.25; pa 1.06; ti 1.14; ta 1.08; total 4.53. Spination: palp, leg1, leg2 spineless. Fe3 dorsal spineless; ti3 dorsal spines arranged in two bands: proximal 1.0.1; distal 1.0.0-1; ti3 ventral 2 terminal spines. Fe4 dorsal spines in two rows: anterior 1-0; posterior 4-3; ti4 dorsal spines arranged in two bands: proximal 0.0.1; distal 0.0.1; ti4 ventral 2 terminal spines. Dorsal side of frontal legs with a piligerous, fine-textured, granular surface; ventral side of palp covered with hairs, without a granular surface; very long hairs on back legs as well as on palps. Claws with 8 teeth or less, robust, hardly larger than claw width.

Abdomen 6.02 mm long; cream-colored; cylindrical. Abdominal dorsal hairs 0.144 mm long; thick, roughly straight, compressed, lanceolate, frontally curved; uniformly, thickly distributed.

Male bulb (Fig. 162): T slightly smaller than DD; external, internal distal border sloped backwards. DD slightly bent in lateral view, clearly less than  $45^\circ$ ; internal distal border not expanded. IS and ES equally developed; IS truncated at DD middle part. DD tip (Figs. 166-169) straight in lateral view. C present, short; distal end on DD internal tip; well-developed; located close to DD distal tip; proximal border sharply decreasing; distal border stepped, upper tip not projected, rounded; external side hollowed. L well-developed; external border not sclerotized, distally markedly folded; distal border divergent, discontinuous but without a fold at the middle. AL present, hardly visible except for a small notch; proximal border in posterior view fused with DH except for its most internal part. P (Fig. 170) fused to T; perpendicular to T in lateral view; lateral length from  $\frac{2}{5}$ - $\frac{1}{2}$  of T width; ridge present, perpendicular to T, not expanded; upper margin markedly toothed, along its

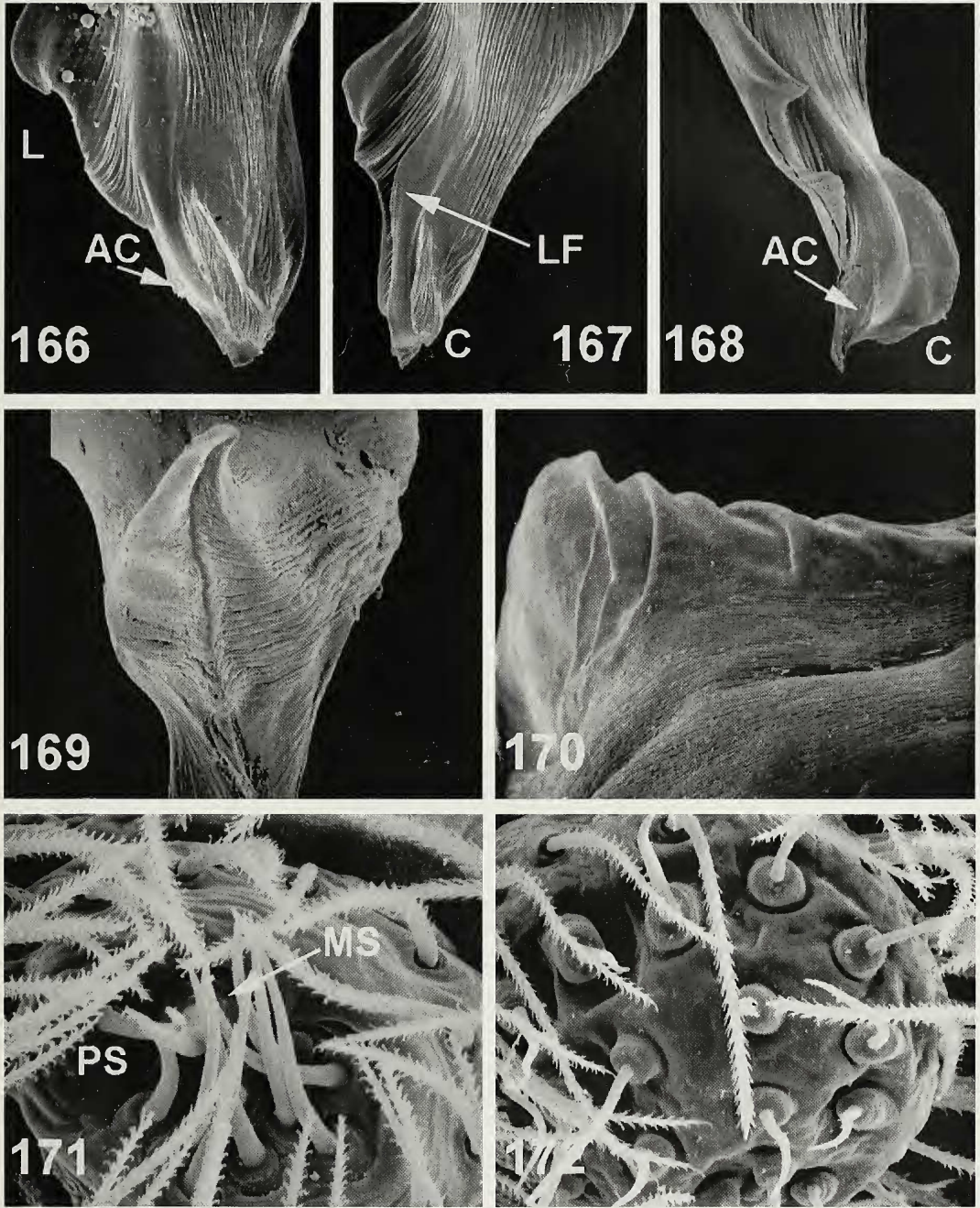
extent, few teeth; not distally projected; back margin not folded.

*Female*: (from Barranco de Badajoz, Güimar, Tenerife; num. 3192, UB; Figs. 163-165, 171, 172.) All characters as in male except: Carapace 4.34 mm long; maximum width 3.57 mm; minimum width 2.52 mm. AME diameter 0.23 mm; PLE 0.21 mm; PME 0.16 mm; PME  $\frac{2}{5}$  diameter from PLE. Sternum brownish-red.

Chelicerae 2.03 mm long; fang 1.33 mm. Leg lengths of female described above: fe1 3.43 mm (all measurements in mm); pa1 2.31; ti1 2.87; me1 2.87; ta1 0.66; total 12.14; fe2 3.22; pa2 2.17; ti2 2.52; me2 2.73; ta2 0.63; total 11.27; fe3 2.45; pa3 1.47; ti3 1.82; me3 2.31; ta3 0.63; total 8.68; fe4 3.57; pa4 1.89; ti4 2.73; me4 2.15; ta4 0.77; total 12.11; relative length  $1 > 4 > 2 > 3$ ; palp: fe 2.03; pa 1.05; ti 0.84; ta 1.12; total 5.04. Spination: palp, leg1, leg2 spineless. Fe3 dorsal spineless; ti3 dorsal spines arranged in two bands: proximal 1.1-0.1; distal 1.0.0; ti3 ventral 2 terminal spines. Fe4 dorsal spines in two rows: anterior 1; posterior 3; ti4 dorsal spines arranged in two bands: proximal 0.0.1; distal 0.0.1; ti4 ventral 2 terminal spines.

Abdomen 6.23 mm long; cream-colored; cylindrical. Abdominal dorsal hairs 0.153 mm long; thick, roughly straight, compressed, lanceolate, frontally curved; uniformly, thickly distributed. Vulva (Figs. 163-165) arch-like in dorsal view, frontally pointed; slightly wider than long; DF wide. MF poorly developed. VA frontal region completely sclerotized; posterior region sclerotized at anterior area; tooth-shaped expansion from internal back border, not joined to lateral sclerotization, slightly shorter than DF lateral margins, markedly bent towards lateral area. AVD hardly visible. S attachment not projected under VA; arms as long as DA, clearly curved; tips dorsally projected; neck as wide as arms. TB usual shape. ALS (Figs. 171-172) with PS; remaining piriform spigots more external than MS, arranged in three rows; 9 + 1 piriform gland spigots; PMS, PLS with 10-15 aciniform gland spigots.

**Intraspecific variation.**—Male cephalothorax ranges in length from 3.54-4.43 mm, female from 3.77-4.69 mm. Sternum ornamentation variable, from hardly wrinkled between coxae to completely wrinkled. Chelicera lacking dorsal distal granulations or



Figures 166–172.—*Dysdera propinqua*, right male bulb and female spinnerets. 166, DD frontal, LF absent; 167, DD, frontal, LF present; 168, DD external; 169, DD posterior; 170, P external; 171, Right ALS; 172, Right PLS.

somewhat reduced. P  $\frac{1}{3}$  of T width. One specimen from Teno with well-developed LF (Fig. 167). Vulva frontally round. Ventral tooth-shaped sclerotization shorter, about  $\frac{1}{3}$  of DF lateral length. Spination variation given in Table 14.

**Additional material examined.**—**TENERIFE:** ? : ?; 24 February 1984, 1♂ (N.P. Ashmole, num. 2728 UL). Fuente de Mesa, 9 March 1984, 2♀ (J.M. Peraza, num. 2770 UL). *Adeje:* Roque del Conde, 16 March 1996, 1♂ (Oromí, num. 3123 UB); 1♀ (Oromí, num. 3124 UB). *Arafo:* Fuente

del Joco, 5km NW from Arafo, 1930 m, 28 December 1994, 2♀ (F. Gasparo, FG). *Arico*: Barranco del Rio, 22 February 1984, 1juv. (P. Ashmole, num. 2685 UL); 15–22 October 1984, 1♂ (J.M. Peraza, num. 2772 UL); 16–23 November 1984, 1♂1♀ (J.M. Peraza, num. 2721 UL); 17–26 September 1985, 1♂1♀ (J.M. Peraza, num. 2613 MCNT). *Buenavista*: Barranco de las Cuevas, 4 February 1989, 1♀ (H. Enghoff, num. 2642 ZMK). Casa Blanca close to W Buenavista, 4 February 1989, 1♀ (H. Enghoff, num. 2650 ZMK). *El Rosario*: Las Raices, November 1993, 1♂ (Arnedo & Ribera, num. 4796 (T17) UB). *Granadilla*: Madre del Agua, November 1993, 1♀ (Arnedo & Fluhr, num. 4797 (T22) UB); 1juv. (Arnedo & Fluhr, num. 4798 (T42) UB); 1♂ (Arnedo & Fluhr, num. 4813 (T4) UB). *Güümar*: Barranco de Badajoz, 18 December 1996, 4♀, (P. Oromí, num. 3210 UB). *La Laguna*: Bajamar, 10 September 1985, 1♂ (J.M. Peraza, num. AR-202 MCNT). El Moquinal, 23 January 1997, 1♂3♀ (P. Oromí, num. 3196 UB). Monte de las Mercedes, 18 March 1990, 1♂ (C.G. Campos, num. 2726 UL). *La Orotava*: Base zig-zag, 17 October 1984, 1♂ (C.G. Campos, num. 2696 UL). El Guancho close to Aguamansa, 5 March 1987, 1♂ (H. Enghoff, num. 2649 ZMK). Hierba Pajonera, 2050 m, 19 June 1984, 1♂ (C.G. Campos, num. 2724 UL). Izaña, 13 March 1987, 1♀ (H. Enghoff, num. 2641 ZMK). Las Cañadas del Teide, 1♀, (J. Wunderlich, num. 2629 JW); 1 March 1984, 1♂ (C.G. Campos, num. 2761 UL); 19 April 1984, 1♂ (C.G. Campos, num. 2763 UL); 2100 m, 18 June 1984, 1♀ (C.G. Campos, num. 2725 UL); 19 September 1984, 1♀ (C.G. Campos, num. 2762 UL); 2050 m, 10 November 1984, 1♀, (C.G. Campos, num. 2722 UL); 29 June 1995, 1juv. (A. Camacho, num. 3159 UB); 2 May 1996, 1♂ (N. Zurita, num. 3171 UB). Montaña de Los Conejos, 2400 m, 18 June 1984, 1♂ (C.G. Campos, num. 2723 UL). Pico Viejo, 9 November 1983, 1♀ (C.G. Campos, num. 2695 UL). Retamar, 3050 m, 19 June 1984, 1juv. (C.G. Campos, num. 2765 UL). Teide, 2700 m, 19 June 1984, 1♂1♀ (C.G. Campos, num. 2713 UL). 3050 m, 18 September 1984, 1juv. (C.G. Campos, num. 2764 UL). Ucanca, 2100 m, 1 July 1990, 1♂ (C.G. Campos, num. 2745 UL). *Santa Cruz de Tenerife*: Bailadero, November 1993, 1♂ (Arnedo & Ribera, num. 4833 (T47) UB). Anaga, Cruz del Carmen, 12 May 1996, 1♂1♀ (M. Naranjo, num. 3146 UB); 1♀ (M. Naranjo, num. 3147 UB). Taganana, 1♂ (Oromí, num. 2932 UB). *Los Realejos*: La Fortaleza, 25 February 1983, 1♂ (A. Fox, num. 2727 UL); 26 December 1984, 1♂ (C.G. Campos, num. 2699 UL). Pinar Roque Peral, 19 May 1984, 1♂ (C.G. Campos, num. 2692 UL); 18 October 1984, 1♂ (C.G. Campos, num. 2698 UL); 1♂, 1juv. (C.G. Campos, num. 2700 UL). *Los Silos*: Teno, Monte del Agua, 1 February 1988, 1♂1♀ (J.J. Naranjo, num. 2598 UL); 1♂2♀ (P. Oromí, num. 2683

UL); 1 March 1989, 2♀ (P. Oromí, num. 2684 UL); 30 November 1993, 1♂ (M.A. Arnedo, num. 3181 UB). *Santa Ursula*: Barranco del Pino, 15 November 1984, 4♀ (J.M. Peraza, num. 2720 UL). Monte de Santa Ursula, 13 December 1996, 1♀, (P. Oromí, num. 3191 UB). *Vilaflor*: El Pinalito, 20–27 December 1984, 1♂1♀, (J.M. Peraza, num. 2620 MCNT); 16–23 February 1985, 1♀, (J.M. Peraza, num. 2607 MCNT); 1♂1♀ (J.M. Peraza, num. 2610 MCNT). *Dysdera obscuripes*: **TENERIFE**: *Arico*: Barranco del Rio, in I, 1♂ paratype, (Wunderlich, num. 2626 JW); 27 January 1985, 1♀ paratype, (Wunderlich, num. 2628 JW). *La Laguna*: El Moquinal, 20 April 1990, 1♂ (P. Oromí, num. 2620 SMF). *La Orotava*: Cañadas del Teide, ?, 1♂ paratype, (Wunderlich, num. 2622 JW).

**Distribution.**—Tenerifean endemic. The most widespread species in Tenerife. It has been collected throughout the island, with the exception of the middle-northern slope.

**Comments.**—Examination of several paratypes of *D. obscuripes* showed that no diagnostic feature exists when compared with *D. propinqua* holotype. The females used by Simon in the original description of *D. insulana* were also available for study. The author himself (Simon 1907) transferred these females to *D. nesiotetes* Simon 1907. The study of the specimens revealed that they were neither *D. insulana* nor *D. nesiotetes*, while they perfectly fit those characters of *D. propinqua*. The male type specimens of *D. nesiotetes* are the only known specimens of this species so far.

*Dysdera unguimmanis* Ribera, Ferrández & Blasco 1985

Figs. 173–177, 187–189, Table 15

*Dysdera unguimmanis* Ribera, Ferrández & Blasco 1985: 57–59, fig. 2A–E [♀]. Holotype female from Cueva del Viento-Sobrado, Icod de los Vinos, Tenerife, Canary Islands; 10 February 1982, J.L. Martín leg.; num. T-CV-121; Stored at UL. Examined. -Wunderlich 1991: 284–286.

**Diagnosis.**—*Dysdera unguimmanis* is distinguished from all other *Dysdera* species by absence of eyes, remarkable elongation of appendages, reduction of body pigmentation and uniquely large tarsal claws (Fig. 187).

**Description.**—*Holotype female*: Figs. 173–177. Carapace (Fig. 173) 2.73 mm long; maximum width 2.02 mm; minimum width 1.12 mm. Pale yellow, uniformly distributed; smooth with some small black granular texture mainly at front; hairy, covered with black

Table 15.—Intraspecific spination variability of *Dysdera unguimmani*.

	Proximal	Medial-proximal	Medial-distal	Distal
Tibia 3 dorsal	0-1.0.0	0	0	0-1.0.0-1
Tibia 4 dorsal	1.0.1	0	0	1.0.1
Tibia 3 ventral	0	0	0	0-1.0.0
Tibia 4 ventral	0	0	0	0-1.0.0-1

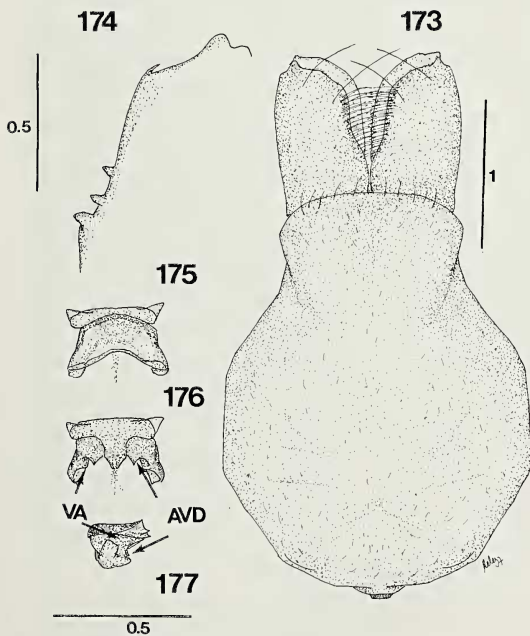
hairs mainly at lateral and back borders. Frontal border roughly round, markedly smaller than  $\frac{1}{2}$  carapace length; anterior lateral borders parallel, long; sharpened at maximum dorsal width point, back lateral borders straight; back margin wide, straight. Eyeless. Labium trapezoid-shaped, base wider than distal part; as long as wide at base (square-like); semicircular groove at tip. Sternum yellow, uniformly distributed; smooth; covered in hairs mainly on margin.

Chelicerae (Fig. 174) 1.23 mm long, about  $\frac{1}{3}$  of carapace length in dorsal view; fang medium-sized, 0.93 mm; basal segment proximal dorsal side scantily covered with piligerous granulations at internal margin. Chelicera inner groove medium-size, about  $\frac{2}{5}$  cheliceral

length; armed with three teeth and lamina at base;  $B > D > M$  (M, D small); D triangular, located roughly at center of groove; B close to basal lamina; M at middle of B and D. Legs whitish. Lengths of female described above: fe1 3.79 mm (all measurements in mm); pa1 1.64; ti1 3.41; me1 3.29; ta1 1.01; total 13.14; fe2 3.84; pa2 1.64; ti2 3.54; me2 3.03; ta2 1.01; total 13.06; fe3 3.29; pa3 1.39; ti3 2.53; me3 3.03; ta3 1.01; total 11.25; fe4 3.92; pa4 1.52; ti4 3.11; me4 3.41; ta4 1.01; total 12.97; relative length:  $1 > 2 > 4 > 3$ ; palp: fe 1.14; pa 0.76; ti 0.88; ta 1.31; total 4.09. Spination: palp, leg1, leg2 spineless. Fe3 dorsal spineless; ti3 dorsal spines arranged in two bands: proximal 1.0.0; distal 1.0.1; ti3 ventral 2 terminal spines. Fe4 dorsal spineless; ti4 dorsal spines arranged in two bands; proximal 1.0.1; distal 1.0.1; ti4 ventral 2 terminal spines. Dorsal side of frontal legs smooth; ventral side of palp smooth. Claws markedly bent; with 10–14 teeth, in two groups, slender, unusually long (Fig. 187).

Abdomen 6.9 mm long; cream-colored; cylindrical. Abdominal dorsal hairs 0.072–0.09 mm long; thin, curved, compressed, pointed; uniformly, scantily distributed. Vulva (Figs. 175–177) rectangle-like (?); wider than long; DF wide. MF well-developed; sclerotized at frontal part. VA frontal region completely sclerotized; posterior region sclerotized at anterior area; tooth-shaped expansion from back border; not joined to lateral sclerotization, about half of DF lateral margins. AVD clearly recognizable. S attachment projected under VA; arms as long as DA, clearly curved; tips not projected; neck as wide as arms. TB usual shape. ALS (Figs. 188–189) with PS; remaining piriform spigots more external than MS, arranged in one row; 3 + 1 piriform gland spigots; PMS, PLS with fewer than 5 aciniform gland spigots.

*Male*: Unknown.



Figures 173–177.—*Dysdera unguimmani*. 173, Carapace, dorsal; 174, Left chelicera, ventral; 175, Vulva, dorsal; 176, Vulva, ventral; 177, Vulva, lateral. Scale bars in mm.

Table 16.—Intraspecific spination variability of *Dysdera volcania*.

	Proximal	Medial-proximal	Medial-distal	Distal
Tibia 3 dorsal	1.0.1	0	0	1.0.0
Tibia 4 dorsal	0.0.1	1.0-1.1	0	1.0.1
Tibia 3 ventral	1.1.0	0	0	1.0.0
Tibia 4 ventral	1.1.1	0	0	1.0.1

**Intraspecific variation.**—DA arch-like in dorsal view. Spination variability in Table 15.

**Additional material examined.**—**TENERIFE:** *Icod de los Vinos:* Cueva de Felipe Reventón, 17 March 1984, 1juv. (J.J. Hernández, num. 2584 UL); 10 September 1992, 1juv. (P. Oromí, num. 2535 UB); November 1993, 1♀ (Arnedo & Ribera, num. 4829 (T44) UB). *Cueva del Viento-Sobrado,* 10 September 1992, 1juv. (H. Enghoff, num. 2630 ZMK); 19 October 1994, 1juv. (Arnedo & Ribera, num. 4822 (T33) UB); 9 June 1996, 1juv. (P. Oromí, num. 3174 UB). *La Orotava:* Cueva del Bucio, 30 October 1991, 1juv. (P. Oromí, num. 2540 UL).

**Distribution.**—Tenerifean endemic. Known from several lava tubes located on the northern slope of the island.

*Dysdera volcania* Ribera, Ferrández & Blasco 1985

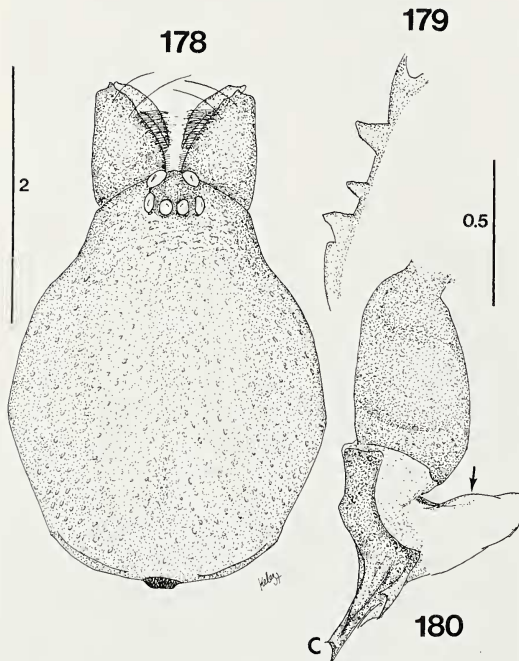
Figs. 178–186, Table 16

*Dysdera volcania* Ribera, Ferrández & Blasco 1985: 59–61, fig. 3A–D [♂] (♂; non ♀, incorrect identification). Holotype male from Cueva de Felipe Reventón, Icod de los Vinos, Tenerife, Canary Islands; 10 February 1982, P. Oromí leg.; num. T-FR-106; Stored at UL. Examined. -Wunderlich 1991: 284–287.

**Diagnosis.**—*Dysdera volcania* is distinguished from other Canarian *Dysdera*, except *D. montanetensis* and *D. gibbifera*, by male bulb having distinctly expanded and unsclerotized upper margin of posterior apophysis (P) (Fig. 179). It differs from *D. montanetensis* and *D. gibbifera* by its markedly foveate carapace.

**Description.**—*Holotype male:* Figs. 178–186. Carapace (Fig. 178) 3.5 mm long; maximum width 2.5 mm; minimum width 1.44 mm. Dark red, darkened at borders; heavily wrinkled, foveate, covered with tiny granulations. Frontal border roughly round, markedly smaller than  $\frac{1}{2}$  carapace length; anterior lateral borders divergent; rounded at maximum dorsal width point, back lateral borders rounded; back margin wide, straight. AME diameter 0.24 mm; PLE 0.21 mm; PME 0.15 mm; AME on edge of frontal border, separated one from another about  $\frac{1}{2}$  of diameter, close to PLE; PME about  $\frac{1}{4}$  of diameter apart, about  $\frac{1}{3}$  PME diameter from PLE. Labium trapezoid-shaped, base wider than distal part; longer than wide at base (rectangle-like); semi-circular groove at tip. Sternum dark red, uniformly distributed; wrinkled; covered in hairs mainly on margin.

Chelicerae (Fig. 179) 1.30 mm long, about  $\frac{1}{3}$  of carapace length in dorsal view; fang short, 0.88 mm; basal segment dorsal, ventral side completely covered with large piligerous granulations. Chelicera inner groove short, about  $\frac{1}{3}$  cheliceral length; armed with three



Figures 178–180.—*Dysdera volcania*. 178, Carapace, dorsal; 179, Left chelicera, ventral; 180, Left male bulb, external. Scale bars in mm.

teeth and lamina at base; D = Bmt M (or D slightly larger; D, B large); D trapezoid, located near segment tip; B close to basal lamina; M close to B. Legs orange. Lengths of male described above: fe1 3.36 mm (all measurements in mm); pa1 1.99; ti1 2.78; me1 2.78; ta1 0.76; total 11.67; fe2 3.16; pa2 1.89; ti2 2.65; me2 2.78; ta2 0.76; total 11.24; fe3 2.65; pa3 1.26; ti3 1.89; me3 2.6; ta3 0.68; total 9.08; fe4 3.67; pa4 1.64; ti4 2.86; me4 3.59; ta4 0.83; total 12.59; relative length:  $4 > 1 > 2 > 3$ ; palp: fe 1.77; pa 0.93; ti 1.01; ta 1.06; total 4.77. Spination: palp, leg1, leg2 spineless. Fe3 dorsal spineless; ti3 dorsal spines arranged in two bands; proximal 1.0.1; distal 1.0.0; ti3 ventral spines arranged in two bands: proximal 1.1.0; distal 1.0.0; with two terminal spines. Fe4 dorsal spineless; ti4 dorsal spines arranged in three bands: proximal 0.0.0-1; medial-proximal 1.1.1; distal 1.0.1; ti4 ventral spines arranged in two bands: proximal 1.1.1; distal 1.0.1; with two terminal spines. Dorsal side of front legs covered with a piligerous, fine-textured, granular surface; ventral side of palp scarcely covered with a piligerous, fine-textured granular surface. Claws with more than 20 teeth, slender, length twice claw width.

Abdomen 4 mm long; whitish; cylindrical. Abdominal dorsal hairs 0.063 mm long; medium thickness, roughly straight, not compressed, blunt, tip not enlarged; uniformly, scantily distributed.

Male bulb: (Fig. 180) T as long as DD; external, internal distal border sloped backwards. DD slightly bent in lateral view, roughly 45°; internal distal border not expanded. ES more sclerotized than IS; IS continuous to tip. DD tip (Figs. 181–183) straight in lateral view. C present, short; distal end on DD internal tip; poorly developed; located far from DD distal tip; proximal border continuously decreasing; distal border sloping in its base, upper tip projected, pointed; external side smooth. AC absent. LF present; distally not projected; poorly developed. L well-developed; external border not sclerotized, laterally markedly folded; distal border divergent, continuous. AL present, hardly visible except for a small notch; proximal border in posterior view fused with DH. P (Fig. 184) fused to T; markedly sloped on its proximal part, perpendicular on distal; lateral length markedly longer than T width; ridge present, not sclero-

tized, perpendicular to T, distinctly expanded, rounded; upper margin smooth; not distally projected; back margin not folded.

ALS (Figs. 185–186) with PS; remaining piriform spigots more external than MS, arranged in two rows; 6 + 1 piriform gland spigots; PMS, PLS with 10–15 aciniform gland spigots.

*Female*: Unknown.

**Intraspecific variation.**—Male cephalothorax ranges in length from 3.35–3.50 mm. AME separation from  $\frac{1}{2}$ – $\frac{3}{5}$  of diameter. PLE-PME from  $\frac{1}{5}$ – $\frac{2}{5}$  diameter apart. D markedly larger than B. Spination variability in Table 16.

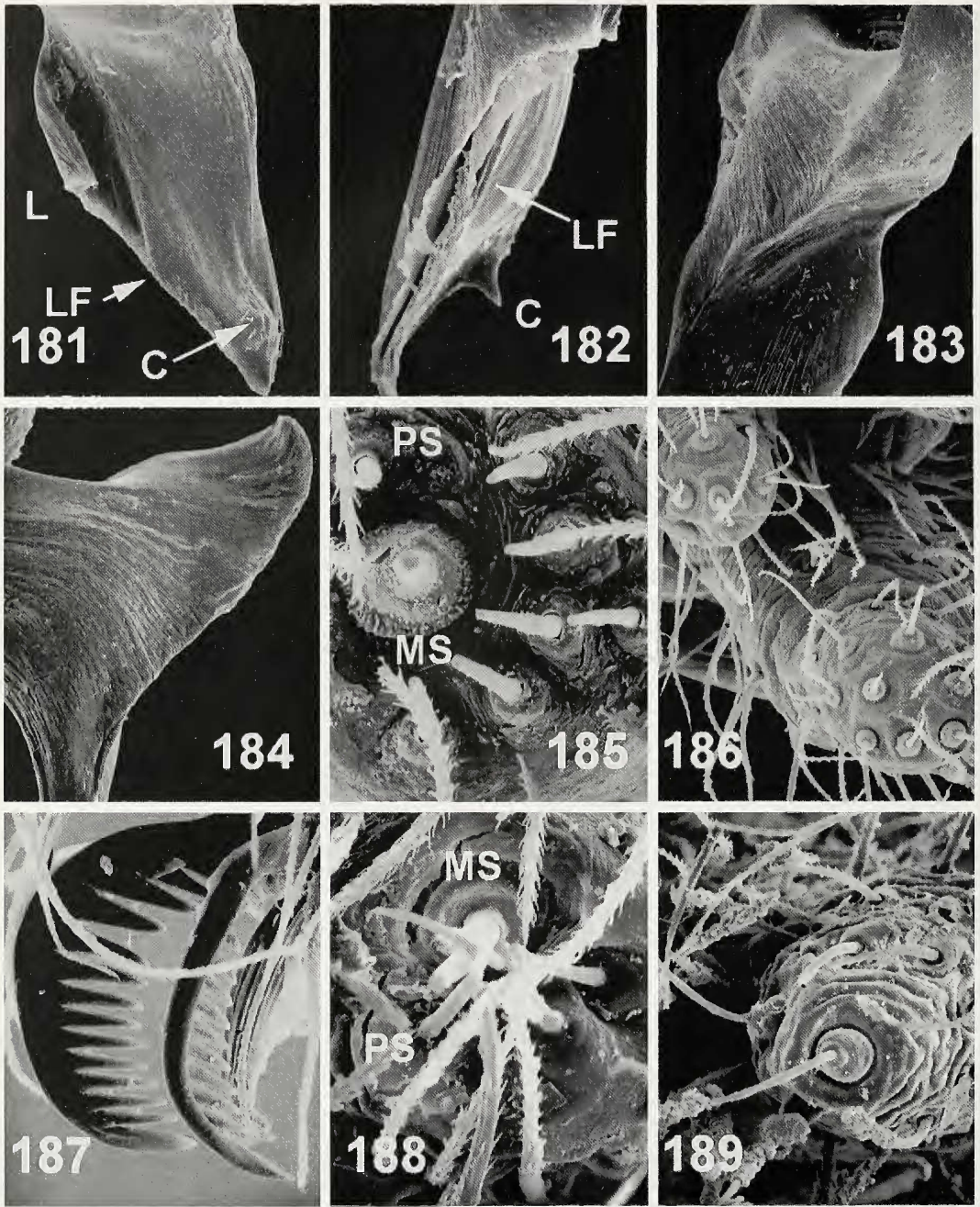
**Additional material examined.**—TENERIFE: *Icod de los Vinos*: Cueva de Felipe Reventón, 12 April 1986, 1♂ (A.L. Medina, num. 2714 UL).

**Distribution.**—Tenerifean endemic. Known from a single locality, a lava tube located on middle-northern slope of the island.

**Comments.**—Examination of the allotype female specimen used in the original description of *D. volcania*, revealed that it actually corresponded to a *D. cribellata* female specimen. Schmidt (1975) reported the presence of *Dysdera rugichelis* Simon 1907 in Tenerife, based on the study of a single male specimen. No other specimen belonging to this species has been documented afterwards, although this is a very abundant and widespread species in La Gomera and La Palma (Arnedo et al. 1996). This record is considered to be doubtful, probably due to incorrect identification. This suggestion is further supported by the proved misidentification of another *D. rugichelis* specimen described by the same author as a new species (Schmidt 1981).

## DISCUSSION

Even though a lot of new material has been available for the present study, several species remain poorly known. In 8 out of the 22 species discussed, one of the sexes is still unknown (*D. chioensis*, *D. curvisetae*, *D. gibbifera*, *D. gollumi*, *D. hernandezii*, *D. labradaensi*, *D. unguimmanis* and *D. volcania*). In addition, some species have been recorded only once, or are known from a single locality. On the other hand, although several expeditions have been conducted with the main goal of collecting *Dysdera* specimens throughout the island, several island regions



Figures 181–189.—181–186, *Dysdera volcanica*, right male bulb and spinnerets. 181, DD frontal; 182, DD external; 183, DD posterior; 184, P internal; 185, Right ALS; 186, Right PMS (upper), PLS (lower). 187–189, *Dysdera unguimmanis*. 187 leg I claws; 188 Right ALS; 189, Right PMS (upper), PLS (lower).

remain undersampled or poorly known. In spite of incompleteness, present data permit limited discussion of ecological and distributional patterns.

As has been reported for other Canarian is-

lands (Arnedo et al. 1996; Arnedo & Ribera 1997), the level of insular endemism is extremely high: 18 out of the 21 species documented in Tenerife, roughly 85% of the species, are endemics. Three species are shared

with neighbor islands: two are found in Gran Canaria (*D. iguanensis* and *D. insulana*) and a third (*D. levipes*) is found in both La Gomera and Gran Canaria.

Distributional patterns are the result of both ecological factors and geological history. Humidity may be considered as the major ecological factor governing *Dysdera* distribution. Most of the species have been documented to occur on the northern slope of the islands from 400–1200 m, which is the most humid region of the island. This humid belt can be further extended to include localities on south-eastern-western slopes where the summit barely reaches 1200 m. Some locations, in spite of being on the dry southern slopes, are actually humid because they are close to nearly permanent watercourses (Barranco del Rio) or correspond to the MSS (Barranco del Chorillo station). Nevertheless, there are some exceptions to the rule, and some species have been reported to live in genuinely dry areas. The taxa *D. macra* and *D. propinqua* have widespread distributions that include humid northern locations as well as very dry places at the high-elevation environments from Las Cañadas or at the southwestern slopes. The only species that has been documented exclusively from dry regions is *D. guayota*. Further investigation of possible physiological adaptations of this species should be conducted in the future.

The geological history of Tenerife is very complex, mainly because of the several volcanic processes involved in its formation. Vulcanism in the Canaries, unlike other oceanic archipelagos (e.g., Hawaiian Islands), is a recurrent process. Several studies, using K-Ar dating, have supplied a large number of data on the age determination of Tenerife (Ancochea et al. 1990 and references herein). They provide a well-documented picture of the volcanic evolution of the island. As recently as 2 Mya, Tenerife was split into three different islands that roughly corresponded to the present-day Anaga, Teno and Roque Conde massifs (Fig. 3). These primitive islands originated in the late Miocene and after several volcanic pulses, volcanic activity ceased about 3.5–4.5 Mya ago. Lava flows from a new volcanic cycle, about 1.9 Mya ago, connected the three massifs and formed Las Cañadas caldera. Volcanic activity in this area has been more or less continuous until historical

ages. Finally, between 0.83 and 0.78 Mya the large ‘valleys’ of Güímar and La Orotava were formed, probably due to a massive landslide. Anaga, Teno and Roque massifs have been considered by several authors as refugial areas or sources of colonizers (Machado 1976; Cobolli Sbordoni et al. 1991; Oromí et al. 1991; Avanzati et al. 1994; Juan et al. 1996). This hypothesis is mainly based on (a) their original isolation (b) the absence of eruptions during the last 4,000,000 years and (c) an extensive surface transformation and habitat destruction in the rest of the island, from 2 Mya ago until the present. There are many examples of distributions from a wide array of taxa that apparently suit this suggested scenario. Tenerifean *Dysdera* provide additional cases which could fit the former hypothesis. Some species have been found exclusively in one of the massifs: *D. insulana* is known only from Anaga and closer localities, while *D. gibbifera* has been collected only in Teno massif and proximities. However, the remaining species have wider distributions. Whether these distributions are the result of dispersal events from some of the mentioned massifs remains to be tested, especially by means of a phylogeographic framework.

Sympatry is another outstanding feature of Canarian *Dysdera* species in general, and Tenerifean ones in particular. As many as four species have been collected in the same locality. In our experience, it was not strange to find two specimens from different species under the same stone. More surprisingly, with a single exception (Cueva del Chío), all the lava tubes where troglobitic *Dysdera* species have been reported hold more than one species. Obviously, such a pattern can only be the result of strong ecological segregation. No close association between any *Dysdera* species and a particular plant community has been observed. In general, species distribution range over two or more different ecological zones. In addition, some species have been collected in areas where original forest has been disturbed by reforestation or introduction of alien plant species. The genus *Dysdera* has frequently been described as a specialist predator of woodlice (Cooke 1965), although a recent study on *D. crocota* prey-preference (Pollard et al. 1995) has shown that this species is better considered as a generalist predator. Whatever taxonomic prey-preference exists in *Dys-*



*dera* species, it is clear that this is strongly constrained from a morphological point of view by body and chelicera-fang size. Tenerife harbors both the largest (*D. labradaensis*) and the smallest (*D. minutissima*) *Dysdera* species ever reported. In addition, there is a wide spectrum of chelicera-fang sizes and, in a lesser degree, of shapes. Experimental studies regarding prey-preference segregation will constitute a promising field of investigation.

Troglobitic species deserve further consideration. Seven Tenerifean species have been collected exclusively in lava tubes and show morphological evidence of adaptation to the hypogean environment. The cave-dwelling *D. ratonensis* from La Palma is the single case of troglomorphy in the Canaries outside Tenerife. Some of the 'a priori' troglomorphic characters held by these species include: eye reduction or loss, appendage elongation and depigmentation. However, these characters are unequally manifested by the different species. For instance, *D. labradaensis* and *D. chioensis* have eyes markedly reduced in size, all of them being present, while *D. unguimmanis* is completely eyeless. In general, the degree of troglomorphy in Canarian species may be considered low, and in most cases it is restricted to eye reduction (Wunderlich 1993). In contrast, *D. unguimmanis* is one of the most troglomorphic taxa in the genus described to date. Apart from the absence of eyes, the noticeable leg elongation and nearly complete depigmentation, this species has an unusual development of the leg claws (unguis). This feature has been observed only in dysderid cave-dwelling species of the genera *Stalita* Schiödte 1847 and *Folkia* Kratochví 1970 and has been considered as a troglomorphic adaptation in collembolans (Christiansen 1961) and cixiid planthoppers (Howarth 1991).

Even though hypogean *Dysdera* in Tenerife have been found exclusively in lava tubes, several observations suggest that more probably *Dysdera* troglobites originated in, or are at least able to disperse through, the so-called mesocavernous shallow stratum (MSS) (Oromí et al. 1986). This hypothesis is supported by the fact that (a) lava tubes have a geologically short time-span (between 0.3–0.5 Mya), (b) two or more hypogean species usually coexist in the same lava tube and (c) they have relatively wide distributional ranges, as shown by the distance between some of the lava tubes where they have been collected.

Finally, considerations regarding morphological affinities as well as inferences about speciation and adaptations to particular environments, i.e., troglomorphy, are avoided in this paper, since they are better discussed in the light of a cladogram for the species.

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